AIA FILE NUMBER 3-C

TECHNICAL INFORMATION

# LIME

# FOR MASONRY MORTAR

**UNITED STATES GYPSUM**
**The Greatest Name in Building**

GENERAL OFFICES—300 WEST ADAMS STREET, CHICAGO 6, ILLINOIS

1955

AIA FILE NUMBER 3-C

# MASONRY MORTAR

## BASIC REQUIREMENTS OF GOOD MASONRY MORTARS

Good masonry walls are expected to be water and weather resistant, and durable with a minimum of maintenance. The essential factors in obtaining such results are:

1. Good Masonry Units—with rate of water absorption (suction), neither too high nor too low.

2. Good Workmanship— Full joints.

3. Good Mortar—which is readily placeable and provides complete and uniform bond with the units by virtue of its high plasticity and water retentivity. It must be durable, weather resistant, possess adequate strength, and be economical.

Assuming a satisfactory masonry unit, then good workmanship and good mortar are so closely allied that neither can be sacrificed without jeopardizing the required results.

## FUNCTION OF LIME IN GOOD MASONRY MORTAR

A good lime, mixed in the proper proportion with portland cement, proper sand, and water, imparts the following required characteristics to masonry mortar:

Plasticity—Lime is both a cementitious and a plasticizing agent. With a given cement and sand, the plasticity of the resulting mortar will vary with the plasticity of the lime. A highly plastic lime is essential to ready placeability of the mortar for well filled joints and water resistant walls. Plasticity is measured by the Emley Plasticimeter. The higher reading enhances the desirable characteristics.

Water Retentivity—Water retentivity is the ability of mortar to resist suction of the building units. A good lime imparts high water retentivity to the mortar. Mortars of high water retentivity bond more uniformly to masonry units before hardening, minimize need for retempering, thereby producing more water resistant joints and minimizing danger of efflorescence. A.S.T.M. mortar specifications require 70 per cent minimum "flow after suction" of mortar as delivered to the mason.

Adequate Strength—Strength of mortar should conform to A.S.T.M. requirements. **High lime content mortars possess adequate strength for all normal building requirements.**

Low Cost—

(a) Mortars having the above characteristics are conducive to rapid, easy, economical, and neat workmanship.

(b) Minimum droppings—Minimum mortar waste.

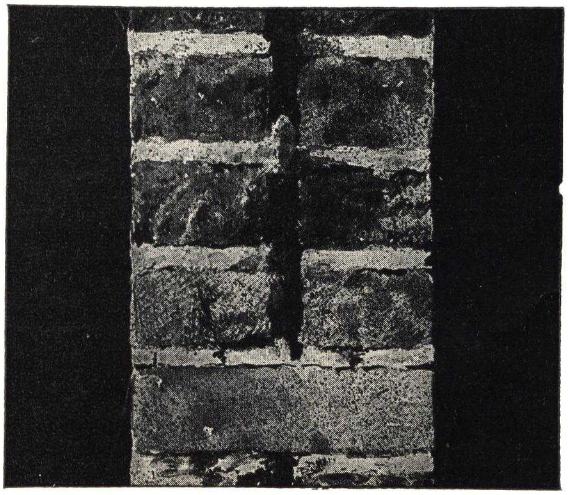
(c) Low maintenance cost.

(d) Mortars are proportioned on a volume basis. A 50 lb. bag of hydrated lime contains approximately 1¼ cubic feet. A mortar mix of one bag of portland cement, two bags of lime and nine cubic feet of sand (1:2½:9) is one of the most economical mortars complying with the characteristics described above.

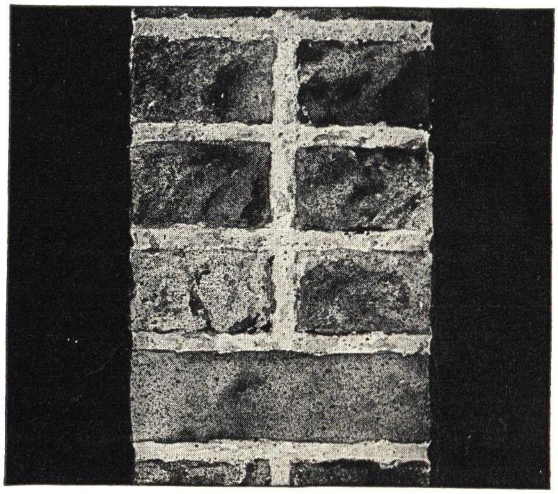
**"MORTASEAL"* and "RED TOP"* are registered trademarks owned by United States Gypsum and are used by it to distinguish its products. "MORTASEAL" identifies the particular hydrated lime; "RED TOP" identifies the particular hydrate or high calcium quicklime and other building products manufactured only by United States Gypsum.**

**A good mortar spreads easily and resists suction of brick.**

**A plastic mortar flows with light pressure and encourages good workmanship.**



**Harsh mortar is conducive to poor workmanship and unfilled joints.**



**Good mortar encourages good workmanship and well filled joints.**

**Trademarks Reg. U. S. Pat. Off.*

# LIME FOR MASONRY MORTAR

## MORTASEAL*

### DESCRIPTION

Mortaseal (Genoa, Ohio Mill) is a double hydrated Ohio dolomitic lime, and Mortaseal (Farnams, Mass. Mill) is a quick-soaking, hydrated, high calcium lime (both less than 8 per cent unhydrated oxides). They meet the following specifications: A.S.T.M. C207-49, Type S; Federal Specifications SS-L-351, Type M, (also Type F though not designated as a finishing lime), including the added requirement of not more than 8% unhydrated oxides; National Lime Association Type S.

### FUNCTION AND UTILITY

Mortaseal lime qualifies most readily with all "Functions of Lime in good Masonry Mortar" described on preceding page as follows:

**Plasticity**—Mortaseal develops exceptional plasticity and workability immediately upon mixing with water—either by machine or by hand. Emley Plasticity of Mortaseal is 250 to 400. This permits a mortar of exceptional working qualities that is conducive to good workmanship and water resistant joints.

Eliminates soaking or slaking of lime.

**High Water Retentivity**—Mortar mixes of 1:2½:9 with Mortaseal lime, as shown in data table, produced the unusually high "flow after suction" (resistance to suction) of 93 per cent.

(a) Facilitates better filling of masonry joints regardless of high or uneven suction.

(b) Conducive to a more complete, strong, uniform bond with masonry units.

(c) Decreases need for retempering.

**Low Volume Change**—Because of the 92 per cent hydration of Mortaseal, volume change due to "unsound" material is negligible.

**Ease of Mixing**—Mortaseal lime requires no soaking or slaking; is placed in mixer in dry state, direct from containers.

**ADEQUATE STRENGTH: A 1:2½:9 mix of portland cement, MORTASEAL and sand complied with A.S.T.M. strength requirements for Type B mortar (750 pounds per square inch at 28 days). See Data below.**

**Lower in Cost** because:

(a) No soaking or slaking required.

(b) High sand-carrying capacity.

(c) Minimum labor required to mix or apply.

(d) Less need to retemper.

(e) Less need to wet masonry units.

(f) A 1:2½:9 Mortaseal mix is one of the lowest cost mortars.

### AVAILABILITY

Available east of the Rocky Mountains.

### LIMITATIONS OF USE

None.

## MASONRY MORTAR DATA

### SPECIFICATIONS FOR MORTAR FOR UNIT MASONRY

| REQUIREMENTS OF ASTM DESIGNATION C270-51T | | | | | | AVERAGE TEST RESULTS USING USG LIMES | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Standards | Property Specifications | | Proportion Specification | | | Job Mixes on Volume Basis | MORTASEAL | | Red Top Masons Hydrate | | Red Top Masons Quicklimes | |
| Mortar Types | Minimum Aver. Comp. Strength psi 28 Days | Flow After Suction Percent Minimum | Portland Cement (1) | Lime (2) | Sand (3) | | Compressive Strength psi (4) | % Flow After (4) Suction | Compressive Strength psi (4) | % Flow After (4) Suction | Compressive Strength psi (4) | % Flow After (4) Suction |
| A-1 | 2500 | 70 | 1 | ¼ | 2.8 to 3¾ | 1:¼:3¾ | 4924 | 69.0 | 3976 | 59.1 | Not Tested | 66.7 |
| A-2 | 1800 | 70 | 1 | ¼ to ½ | 2.8 to 4½ | 1:½:4½ | 3154 | 70.4 | ← | Not | Tested | → |
| B | 750 | 70 | 1 | ½ to 1¼ | 3.4 to 6¾ | 1:1¼:6 | 2150 | 90.6 | 1924 | 75.7 | 1370 | 82.5 |
| | | | | | | 1:1¼:6¾ | 1750 | 78.0 | ← | Not | Tested | → |
| C | 350 | 70 | 1 | 1¼ to 2½ | 5.1 to 10½ | 1:2½:9 | 868 | 93.3 | 786 | 83.2 | 915 | 84.9 |
| | | | | | | 1:2½:10½ | 663 | 78.0 | ← | Not | Tested | → |
| D | 75 | 70 | 1 | 2½ to 4 | 7.9 to 15 | 1:4:15 | 203 | 88.3 | 110 | 76.6 | Not Tested | 82.0 |

**CONCLUSIONS:**

A 1:½:4½ mortar with MORTASEAL complied with Type A-1 Property Specifications.

A 1:1¼:6 mortar with MORTASEAL or RED TOP Masons Hydrate complied with Type A-2 Property Specifications.

A 1:2½:9 mortar with MORTASEAL RED TOP Masons Hydrate or RED TOP Quicklime complied with Type B Property Specifications.

**NOTES:**

(1) PORTLAND CEMENT—To comply with ASTM Designation C150, Type I, II or III; or ASTM Designation C175, Type IA, IIA, or IIIA.

(2) LIME—To comply with ASTM Designation C5 (Quicklime) or ASTM Designation C207 (Hydrated) Type N or S.

(3) SAND AGGREGATE—To comply with ASTM Designation C144 and to be not less than 2¼ and not more than 3 times the sum of the volumes of the cement and lime used, measured in a damp and loose condition.

(4) Based on mortars as delivered to mason having initial flows between 100 and 115%.

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**Trademark Reg. U. S. Pat. Off.*

# LIME FOR MASONRY MORTAR

## RED TOP* MASONS HYDRATED LIME

### DESCRIPTION

A normal hydrated lime, either dolomitic (less than 92 per cent hydration) or high calcium, for use in masonry mortar. Conforms with A.S.T.M. C207-49, Type N; Federal SS-L-351, Type M; National Lime Association Type N.

### FUNCTION AND UTILITY

**Plasticity**—Properly soaked masons hydrated lime has an Emley Plasticity of 150-200, sufficiently high to be conducive to water resistant joints and easy-working mortar.

**Water Retentivity**—"Flow after suction" with a 1:1¼:6 and 1:2½:9 mix was found to exceed 70 per cent, adequate to insure a mortar of good bonding strength and adhesion and of sufficient workability to permit complete filling of joints. A 70 per cent value complies with ASTM standard minimum property requirement for water retentivity.

**Low Volume Change.**

**Adequate Strength.**

### AVAILABILITY

Nationwide.

### LIMITATIONS

1. Must be soaked overnight to develop maximum plasticity.

## RED TOP MASONS QUICKLIME

### DESCRIPTION

RED TOP high calcium quicklime is manufactured in both pulverized or pebble form. Conforms with A.S.T.M. C5-26; Federal Specifications SS-Q-351.

### FUNCTION AND UTILITY

**Properly slaked and aged,** yields a putty which greatly enhances:

(a) Plasticity (300-500 Emley).

(b) Water retentivity approximately 85 per cent obtained for a 1:2½:9 mix.

(c) Workability for water resistant walls.

**High Yield**—Produces over 50 per cent more putty volume than hydrated lime.

**Adequate Strength.**

### LIMITATIONS

1. For best results, quicklime must be of recent manufacture to avoid air slaking in container.
2. Must be handled carefully to avoid burning.
3. Extra slaking and aging time and equipment required.
4. Must be properly slaked and aged.

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## SPECIFICATIONS

(The following are offered as desirable inclusions in any masonry specification, and are not intended as a complete section covering Masonry Specifications.)

### GENERAL PROVISIONS

All masonry materials shall be heated to a temperature such that they will remain above 35° F. until they have been placed and suitably protected.

Masonry shall be protected against freezing for at least 48 hours after placing. Unless such precautions against freezing are taken, no masonry shall be built when temperature is below 32° F. on a rising temperature, or below 40° F. on a falling temperature. No masonry shall be laid on walls that are frozen or contain frost.

### MORTAR MATERIALS

**Lime**—shall be: (*select one*)

(Mortaseal)

(Red Top Masons Hydrated Lime)

(Red Top Masons Quicklime)
manufactured by United States Gypsum Company.

**Portland Cement**—shall conform to (Federal Specification SS-C-192 Type 1) (ASTM C150-47 Type 1).

**Sand**—shall conform to Specifications for Aggregate for Masonry Mortar, ASTM C144-44.

**Water**—used in mixing mortar shall be clean and free from deleterious amounts of acids, alkalies or organic materials.

### LIME PREPARATION (*select one*)

(Mortaseal shall be mixed without soaking or slaking.)

(Red Top *Masons Hydrated Lime* shall be soaked at least 16 hours before using.)

(Red Top *Masons Quicklime* shall be slaked and aged for at least 16 hours, or until the putty temperature is 80° F. or less.)

### MORTAR MIX

**1. Above Grade**—Mortar made from materials complying with the above specifications shall be mixed in proportion of one bag portland cement, two bags lime (or two and one half cubic feet quicklime putty), to not more than nine cubic feet sand (1:2½:9).

**2. Below Grade**—Mortar made from materials complying with these specifications shall be mixed in proportion of one bag portland cement, one bag lime (or one and one quarter cubic feet quicklime putty), to not more than six cubic feet of sand (1:1¼:6).

**3. Specialized Uses—**

(a) For extra-strength, reduce proportion of sand (i.e. 1:2½:8 or 1:1¼:5, but not less than 1:2:6¾ or 1:1:4½).

(b) For extreme strength or under excessive moisture conditions, reduce lime content (viz. 1:1/4:3).

(c) For glass block, use 1:1:5 mix.

(d) For power plant chimneys, use 1:2:5 mix.

(e) For ceramic tile, use 1:1:6 mix.

(f) For gypsum tile, use one part Red Top Partition Tile Cement and three parts sand by weight.

### WORKMANSHIP

***Note to Architect: Detailed workmanship specifications will vary, depending on type of job and building units involved. However, it is suggested that on all masonry work, the following be incorporated:***

1. Mortar shall be laid in a uniform bed without furrows and all joints shall be completely filled. Sufficient mortar shall be placed in mortar beds and in head and collar joints to completely fill all spaces between masonry units.
2. Highly absorbent brick shall be wetted (not *soaked*) before laying.
3. Mortar materials shall be accurately proportioned and thoroughly mixed. Retempering with additional water shall be kept to a minimum. Mortar which has been mixed for more than 2 hours shall be discarded.

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AIA FILE NUMBER 4-E-6

TECHNICAL INFORMATION

# USG* METAL EDGE

## GYPSUM PLANK

**UNITED STATES GYPSUM**
The Greatest Name in Building

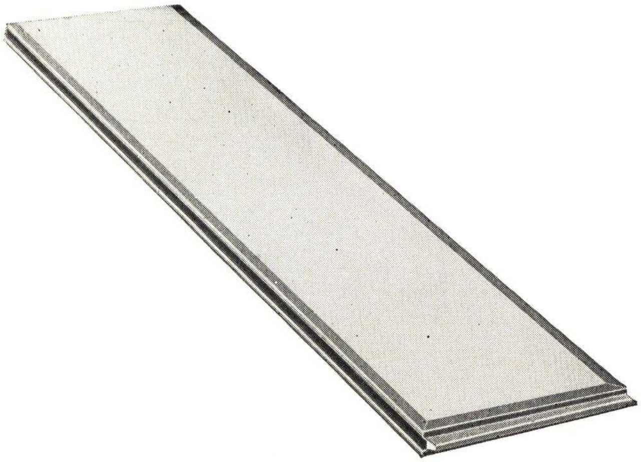
GENERAL OFFICES—300 WEST ADAMS STREET, CHICAGO 6, ILLINOIS

1955

*T. M. Reg. U. S. Pat. Off.

AIA FILE NUMBER 4-E-6

# USG* METAL EDGE GYPSUM PLANK



## DESCRIPTION

Metal Edge Gypsum Plank is a precast structural roof deck unit reinforced on all 4 edges with 21 gauge galvanized sheet steel, formed into tongues and grooves. In addition, it is integrally reinforced with 16 gauge galvanized, electrically welded steel mat.

Size—2″ x 15″ x 10′0″. Covers 12.5 sq. ft.
Weight—13 lbs. per sq. ft.
Maximum span—7′0″.
Maximum Safe Load—75 lbs. per sq. ft.

## FUNCTION AND UTILITY

*TONGUE AND GROOVE INTERLOCKING EDGES.* The accurately formed tongues and grooves on all sides and ends interlock with adjacent plank, thus distributing the load. Tongue and groove edges and sides permit ends of plank to occur off supports. Uniform spacing of roof purlins is therefore not necessary.

*LIGHT WEIGHT.* Only 13 pounds per square foot. Saving in dead load, saves structural steel.

*FIREPROOF.* Will not support combustion. The gypsum will resist high temperatures until fully calcined, a very slow process.

*STRONG.* Maximum recommended span is 7′0″. At this spacing of roof purlins, plank will safely carry super-imposed loads up to 75 pounds per square foot, uniformly distributed.

*ADAPTABLE.* Applicable principally to flat or pitched roofs with true planes up to 30°. Can also be applied to curved or warped areas where the radius of the curve is more than 150 feet.

*EASE OF ERECTION*—Large units with accurately formed metal tongues and grooves mesh and interlock readily, for fast and easy erection.

*NAILABLE.* The dense hard gypsum provides good nail holding power (for light weight shingles, etc.). See Technical Data tables below.

*WINTER CONSTRUCTION.* Since the units are precast and laid without grout, many winter delays are avoided.

*LOW IN COST.* Both material and labor costs are low.

## LIMITATIONS OF USE

**1.** *Job protection.* During job storage, gypsum plank should be protected from exposure to rain and snow. Roof covering should be applied as soon as possible after installation of the plank. *Handle and store on edge.*

**2.** *Roof covering.* Apply built-up roof coverings in accordance with specifications of roof covering manufacturers.

**3.** *Excessive moisture.* Gypsum plank roofs are practical for all buildings having normal humidity conditions. Whenever continuous high humidity is anticipated, such as in wet process plants, consult the nearest USG Sales Office for recommendations.

**4.** *High temperature.* Gypsum plank roofs perform satisfactorily on buildings exposing them to normal to moderately high temperatures. Where unusually high temperatures are expected, such as in foundries, furnace rooms, over breechings, etc., consult the nearest USG Sales Office for recommendations.

**5.** *Steep roofs*—We recommend using USG 3″ Short Span (nailing type) gypsum roof tile on roof pitches over 30°.

## VENTILATION OF ENCLOSED SPACES

All enclosed spaces beneath Roof Decks must be adequately ventilated to the outside as a means of preventing condensation. This principle applies to all constructions whether installed wet or dry.

### TECHNICAL DATA TABLES

#### Thermal Insulation Values

"U" Factor for complete roof slab including built-up roof covering (Btu per sq. ft., per hr., per deg. F. diff. in temperature)

Plank without added insulation—0.53 Btu
Plank with ½″ added insulation—0.29 Btu
Plank with 1″ added insulation—0.20 Btu

Note: The insulation considered is a rigid type wood fiber board with a "k" factor of .32 to .33.

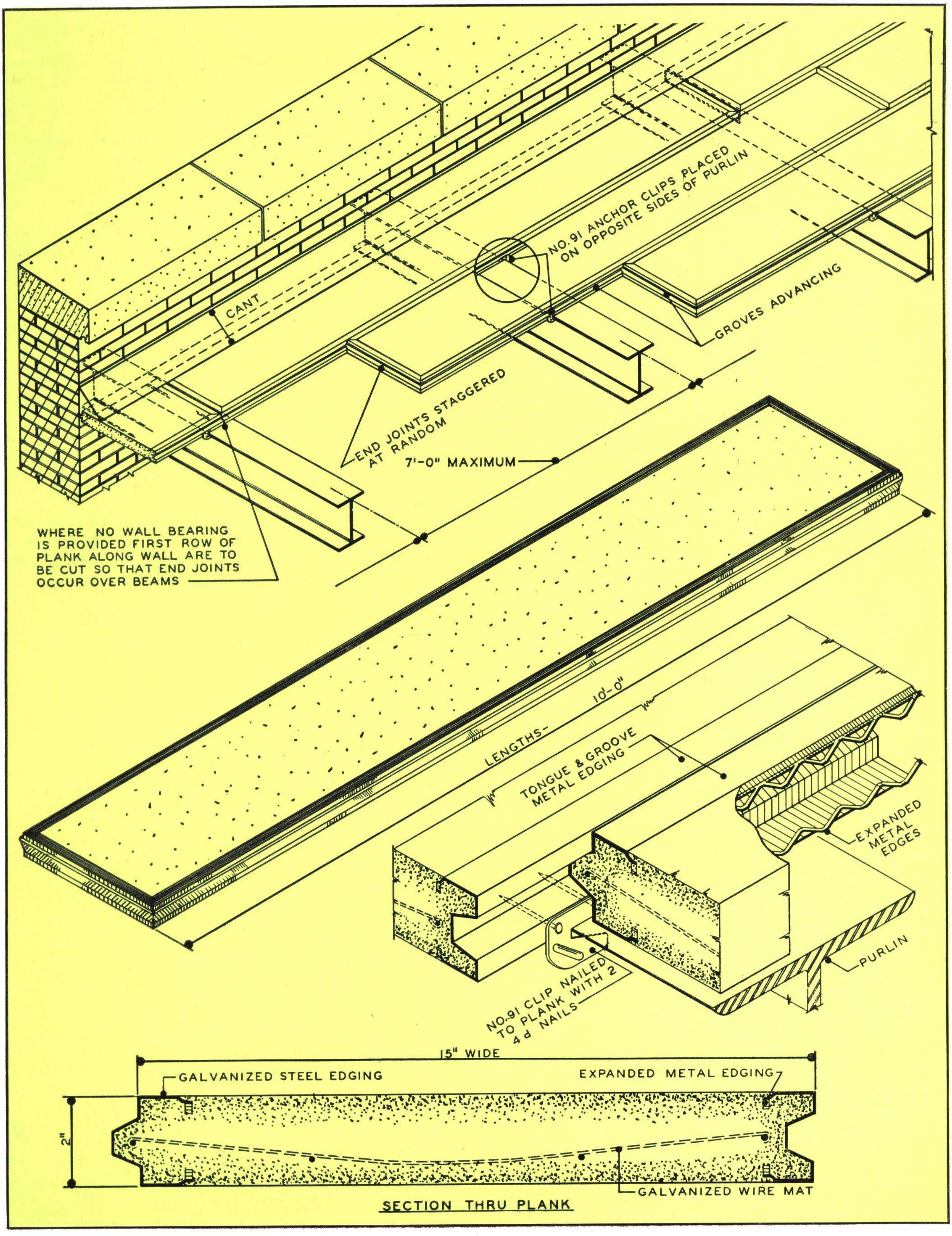
#### Nail Holding Power of Gypsum

| Description of Nail | Holding Power of dry slab. 1½″ Penetration. Lbs. per Nail. |
|---|---|
| 1¾″ LaBelle Square Cut | 150 lbs. |
| 1¾″ Galvanized Roofing Nail | 25 lbs. |

*Trademark Reg. U. S. Pat. Off.*

**"USG", "PYROCELL" and "PYROFILL" are registered trademarks owned by United States Gypsum, used by it to distinguish its products. "PYROFILL" and "PYROCELL" identify the particular gypsum fiber concretes manufactured only by United States Gypsum.**

# USG METAL EDGE GYPSUM PLANK


CANT
NO. 91 ANCHOR CLIPS PLACED ON OPPOSITE SIDES OF PURLIN
GROVES ADVANCING
END JOINTS STAGGERED AT RANDOM
7'-0" MAXIMUM
WHERE NO WALL BEARING IS PROVIDED FIRST ROW OF PLANK ALONG WALL ARE TO BE CUT SO THAT END JOINTS OCCUR OVER BEAMS
LENGTHS- 10'-0"
TONGUE & GROOVE METAL EDGING
EXPANDED METAL EDGES
PURLIN
NO. 91 CLIP NAILED TO PLANK WITH 2 4d NAILS
15" WIDE
GALVANIZED STEEL EDGING
EXPANDED METAL EDGING
2"
GALVANIZED WIRE MAT

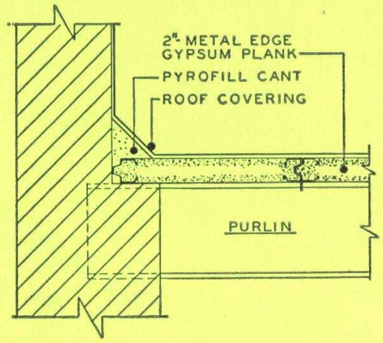
SECTION THRU PLANK

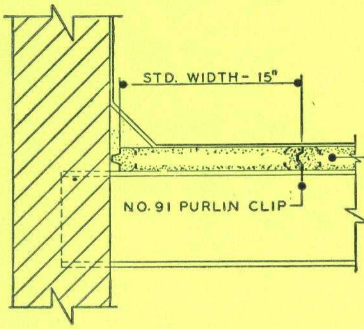
# USG METAL EDGE GYPSUM PLANK

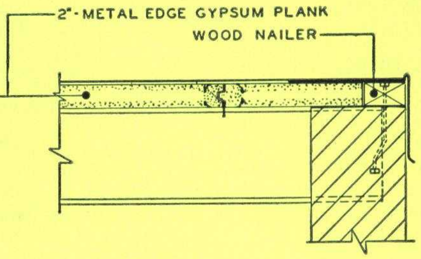
## PARAPET & END WALL DETAILS

SCALE: 3/4" = 1'-0"

## U·S·G METAL EDGE GYPSUM PLANK

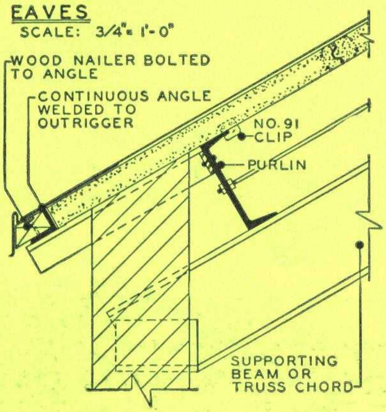


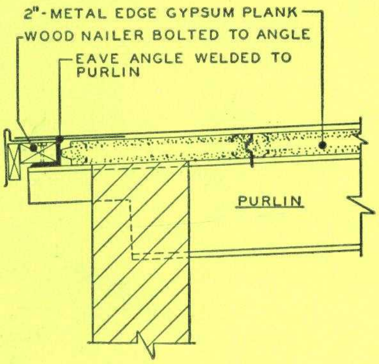


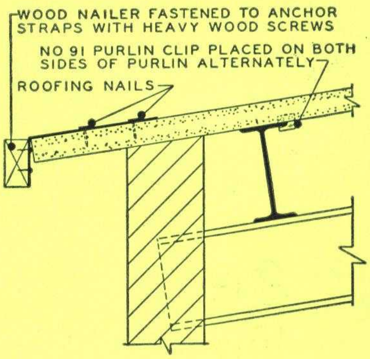


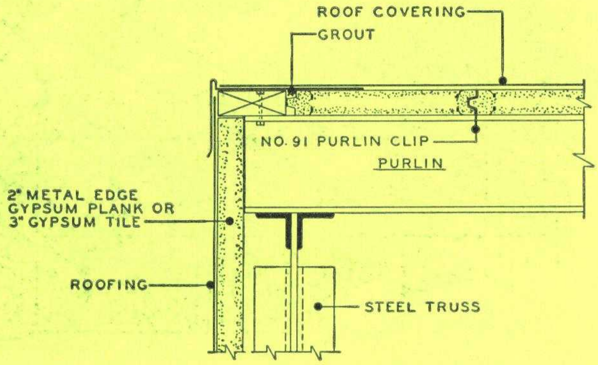
## EAVES

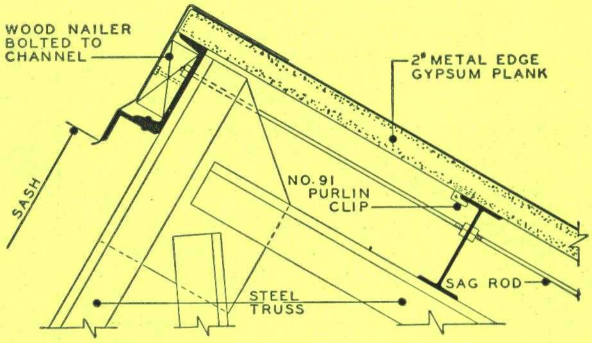
SCALE: 3/4" = 1'-0"


WOOD NAILER BOLTED TO ANGLE
CONTINUOUS ANGLE WELDED TO OUTRIGGER
NO. 91 CLIP
PURLIN
SUPPORTING BEAM OR TRUSS CHORD


2" - METAL EDGE GYPSUM PLANK
WOOD NAILER BOLTED TO ANGLE
EAVE ANGLE WELDED TO PURLIN
PURLIN


WOOD NAILER FASTENED TO ANCHOR STRAPS WITH HEAVY WOOD SCREWS
NO 91 PURLIN CLIP PLACED ON BOTH SIDES OF PURLIN ALTERNATELY
ROOFING NAILS

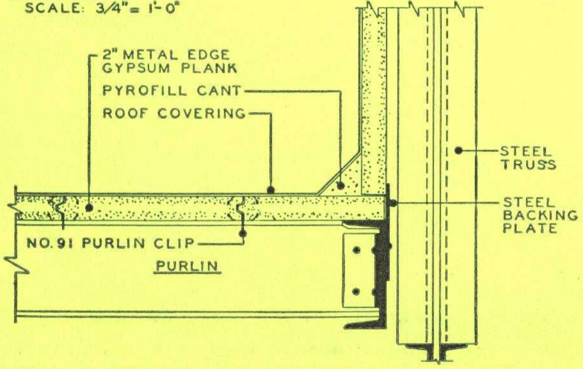


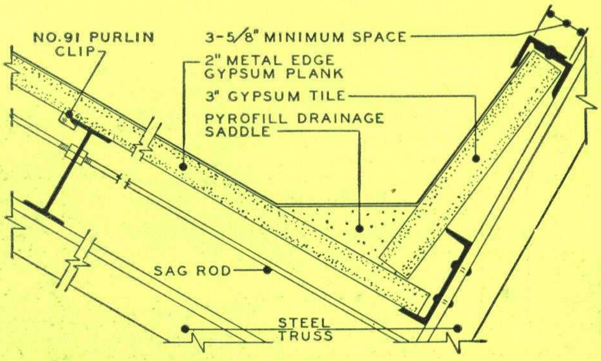


SAWTOOTH SKYLIGHT

## CURBS

SCALE: 3/4" = 1'-0"





SAWTOOTH SKYLIGHT

# USG METAL EDGE GYPSUM PLANK

## DIRECTIONS FOR HANDLING AND ERECTING

### SHIPPING

Plank will be loaded in the car or truck on edge and stacked with spacers between tiers or rows, straw or other protecting fillers will be used at sides and ends of cars and the materials braced or tied to prevent shifting.

Unitized shipment on flat cars is available loaded as shown below. Standard unit lifts contain 100 sq. ft. or 1300 lbs. in carload quantities of 7200 sq. ft.

### UNLOADING AND HANDLING

Plank shall be unloaded and handled on edge. Handling on edge prevents cracking and insures a sound plank at the point of installation on the roof deck.

### STORAGE

When Plank are not taken direct from the car to the roof deck for installation, job storage is necessary and the following is recommended for best results:

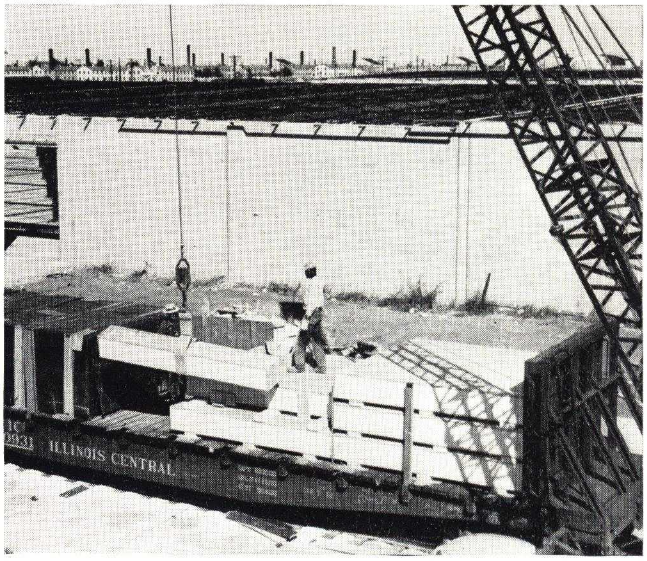
a. Select reasonably level ground with adequate drainage. Place two 4″ x 4″ wood runners on the ground spaced approximately 5′0″ apart. Provide braced posts or other adequate support at each end of pile, to keep tile in vertical position.

b. Pile tile on edge and keep as perpendicular as possible at all times. As tile are being piled they should be spaced apart at about every 8 or 10 tile with ½″ gypsum board dunnage or wood spacers to provide some ventilation through the pile.

c. When the first tier (row) is completed place two 2″ x 4's flat to correspond with the 4″ x 4″ at the bottom and build the second tier in like manner.

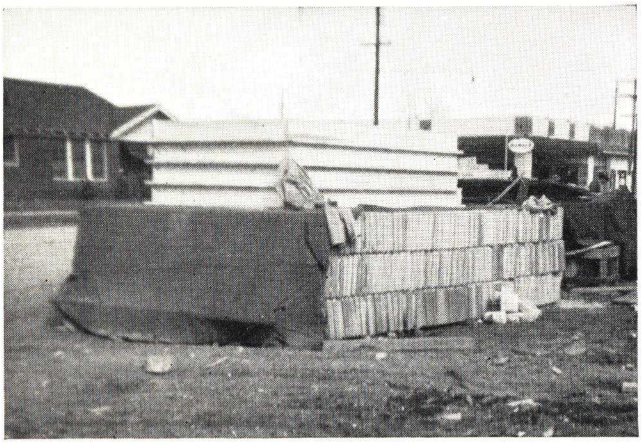
d. On top of the second tier, lay another set of 2″ x 4″ strips laid flat to complete a pile of not more than three tiers high.

e. Cover the storage pile with a tarpaulin, waterproof paper or other rain shed supported above and clear of top sides and ends so that ventilation around and through the tile is possible at all times.



**ABOVE**

Flat car unitized shipments permit fast unloading by crane or fork lift. Erection time is shortened, resulting in economies for the finished job.



**LEFT**

Proper job storage of plank 3 tiers high, spaced to permit ventilation of pile, and covered with a tarpaulin for protection against inclement weather.

## DIRECTIONS FOR HANDLING AND ERECTING (con't)

### ERECTING

**Hoisting**

Plank shall be hoisted to the roof level on edges in strap slings or on lifts and kept on edge as much as possible.

**Starting Point**

It is customary to start at one corner, usually the lowest corner, of each independent roof area to be covered.

**First Plank**

The first plank must be laid so that the side marked "*This side up*" is *up*. This plank must also be laid so that the *groove* is *advancing*.

Fit the first plank as close as possible to the wall or eave yet keep in a true line with the row that is to be laid, so that all succeeding plank and/or rows may be tightly interlocked with closed joints.

**Supports**

The outside edge of all starting or final rows of roof tile must be supported or special precautions taken.

a. When *no wall or purlin support* is provided along the longitudinal edge of the plank, the plank shall be cut so that *end joints will occur over purlins.* We suggest cutting the tongue end of one plank and the groove end of another, to provide right and left cut ends for both starting and completing subsequent rows. *For the final row, if the plank must be cut longitudinally to fit the closing space, we recommend using a suitable steel angle support under the cut edge.*

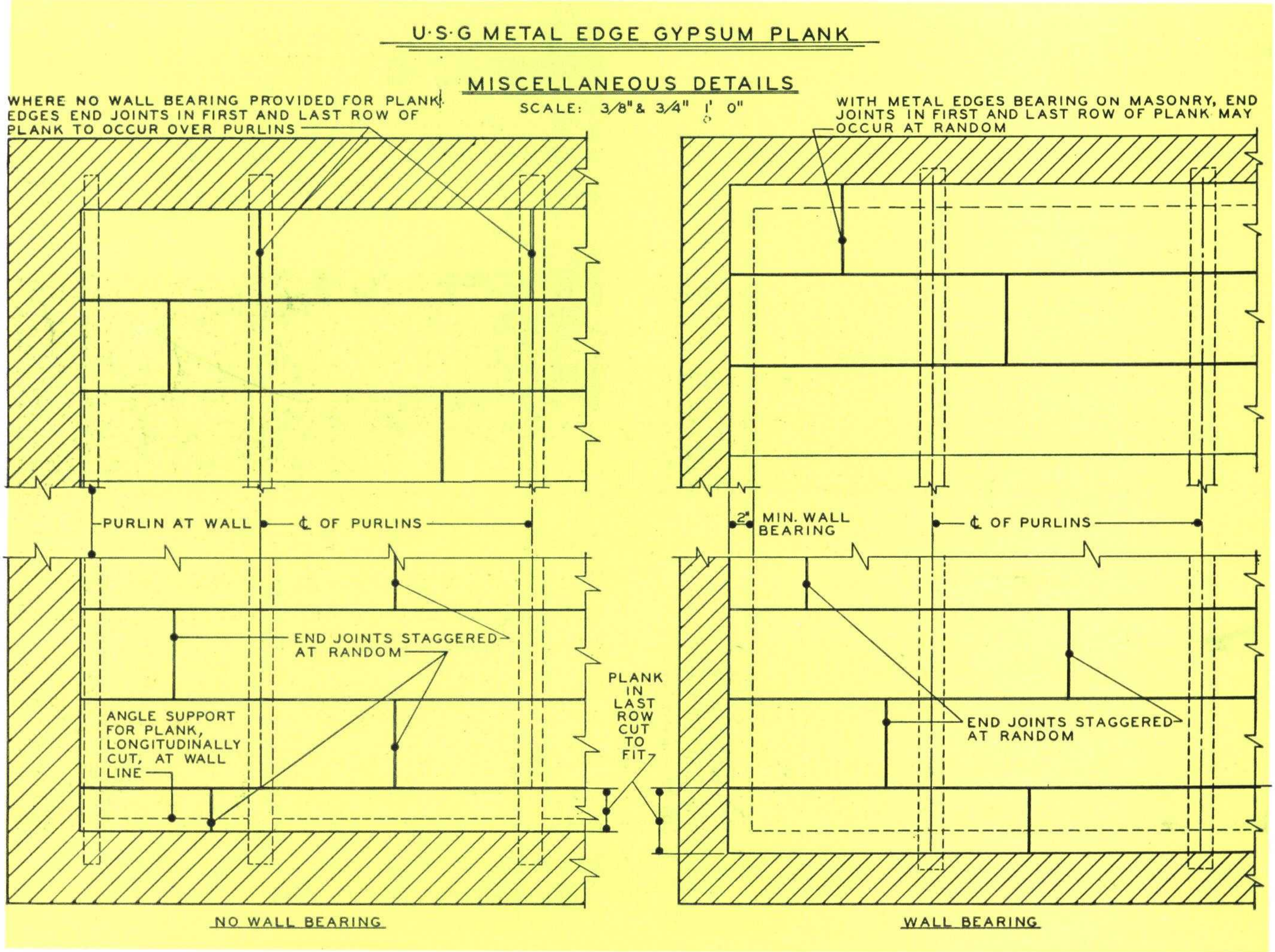
b. When there *is a wall or purlin support* along the longitudinal edge of the starting or final row, of the plank, they are laid continuously.

**First Row**

After the first plank is in place as described above, complete laying plank in the first row by matching or abutting ends and cutting last plank to fit as required.

**Anchorage**

As each plank is laid, it shall be anchored to the roof purlins at each intersection in one of the following ways. (See following page)


U·S·G METAL EDGE GYPSUM PLANK
MISCELLANEOUS DETAILS
SCALE: 3/8" & 3/4" 1' 0"
WHERE NO WALL BEARING PROVIDED FOR PLANK EDGES END JOINTS IN FIRST AND LAST ROW OF PLANK TO OCCUR OVER PURLINS
WITH METAL EDGES BEARING ON MASONRY, END JOINTS IN FIRST AND LAST ROW OF PLANK MAY OCCUR AT RANDOM
PURLIN AT WALL
℄ OF PURLINS
2" MIN. WALL BEARING
℄ OF PURLINS
END JOINTS STAGGERED AT RANDOM
ANGLE SUPPORT FOR PLANK, LONGITUDINALLY CUT, AT WALL LINE
PLANK IN LAST ROW CUT TO FIT
END JOINTS STAGGERED AT RANDOM
NO WALL BEARING
WALL BEARING

## DIRECTIONS FOR HANDLING AND ERECTING (con't)

**a.** Plank laid over *Steel I beams or Bar Joists* having flat flanged top members shall be anchored with a 16 gauge galvanized metal clip (No. 91 Purlin Clip) furnished by the United States Gypsum Co. Two 4 penny galv. slater nails, or 1″ smooth shank No. 11 galv. roofing nails, 4 penny cement coated nails, or similar are required with each clip. Nails are not furnished with the clips by the United States Gypsum Co. For good lateral stiffening of the roof deck it is recommended that the clips be alternately attached on the right and left sides of successive purlins.

**b.** For attaching to other type purlins where clip cannot be used we suggest driving nails through the metal edging on both sides of the purlin and using a wire looped from nail to nail for anchor to the purlin.

**c.** *WOOD JOIST.* Attach plank to wood joists or purlins using two 16 penny nails at each intersection. Drive nails through the gypsum so their heads will be flush with the top surface of the tile.

**d.** Plank installed on slopes over 30°, shall be bolted to the purlins. Use one bolt at each intersection of plank with purlin. Bolt directly through the purlin or through a clip fixed to the underside. Bolt heads should be flush with the top of the tile.

### Cutting

Plank are cut on the job to fit as required. Plank may be cut by hand or with a power saw, as follows:

**a.** When cutting by hand, first cut through the metal edging with a 12″ 18 gauge 14 tooth power hacksaw blade fixed in a Millers Falls type hacksaw frame No. 14½ and then cut the gypsum with an ordinary (carpenters) saw.

**b.** Metal Edge Plank can be readily and economically cut with power driven saws. Use metal or masonry cutting blades as recommended by saw manufacturers. ¼″ steel cored carborundum blades, 12″ in diameter or carbide tipped blades are often used.

### Second Row

The second row and subsequent rows are to be installed by starting with a full or fractional length tile that will permit end joints to be staggered at least 30″ with relation to the end joints of the adjacent row. Continue the row using full length planks with ends tightly matched and finish the row with a full or fractional length plank as required.

### Ridges and Hips

Fill joints at ridges and hips with mortar consisting of gypsum grouting cement and sand mixed in proportion of 1 part cement to two parts clean sharp sand by volume.

### Curved Roofs

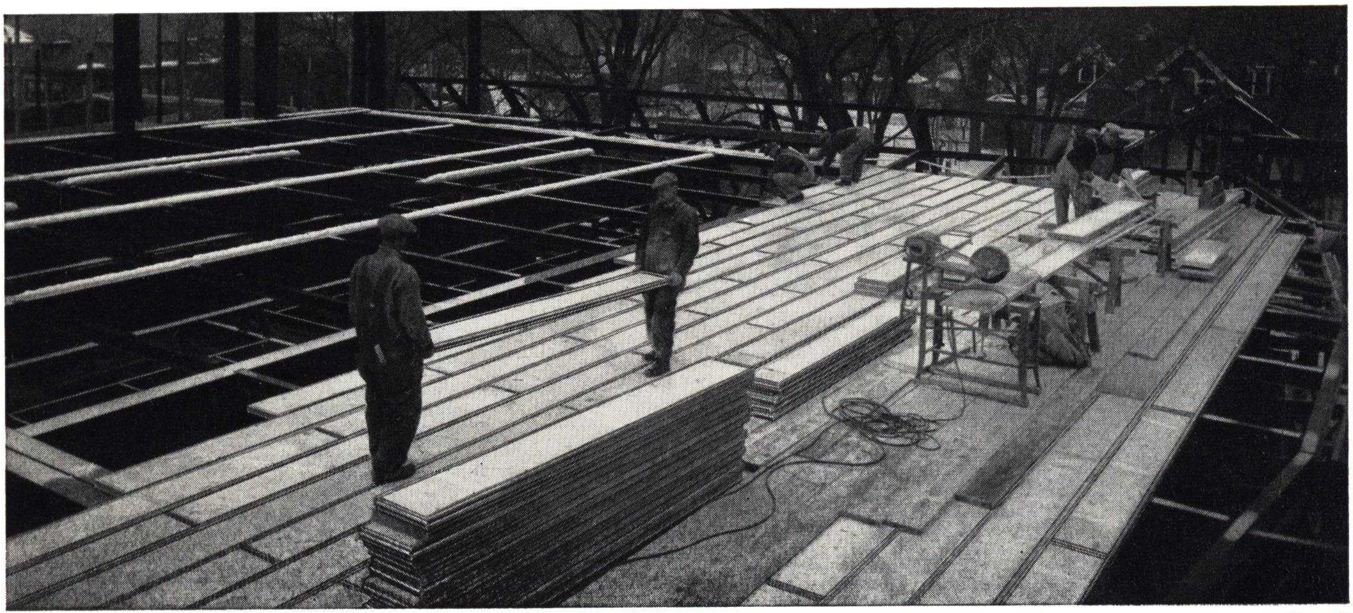
While gypsum plank do not readily lend themselves to application over curved roofs, they can be installed on curves when the radius of the curve is 150 feet or greater.

### Repairing

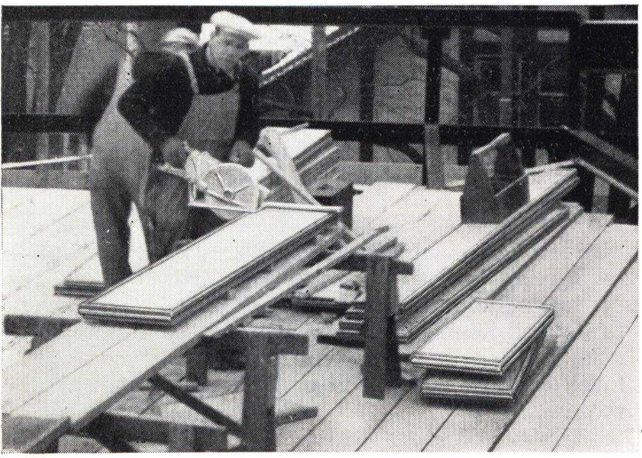
If necessary to repair broken or damaged tile after installation, knock out all broken gypsum (leaving reinforcing mesh in place) and support a form below. Then pour the void full using moulding plaster, mixed with water only. Screed smooth.

### Cants and Drainage Fills

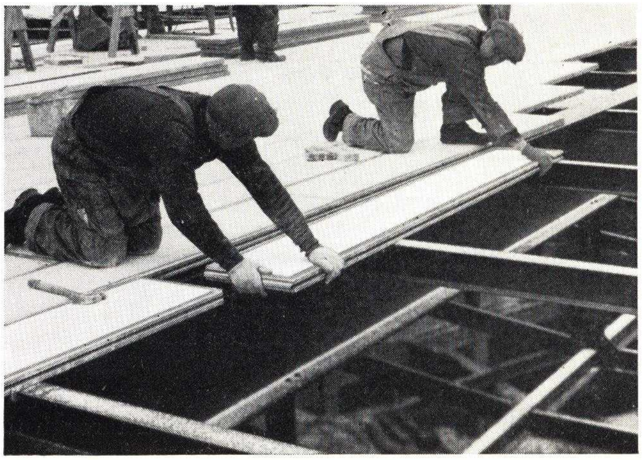
Cant strips and drainage fills can be formed in place, using a gypsum fiber concrete mixed on the job adding water only. Use only gypsum fiber concrete over U S G gypsum plank.



**Erecting USG Metal Edge Gypsum Plank**



Cutting



Placing

## SPECIFICATIONS

### SCOPE

Unless otherwise shown on plans, all roof areas shall be covered with gypsum plank, and all curbs, cants, saddles, etc., shall be as shown or specified herein.

### MATERIALS

*Gypsum plank* shall be 2″ x 15″ x 10′0″ metal edge gypsum plank, manufactured by United States Gypsum Company.

*Clips and nails.* The manufacturer of the gypsum plank shall furnish standard galvanized clips for attachment to main purlins, (200 clips per 1000 sq. ft.). Nails (2 per clip) shall be 4d galvanized slaters or 1″ smooth shank No. 11 ga. galvanized roofing nails.

*Cants and saddles* shall be formed of PYROFILL* gypsum fiber concrete manufactured by United States Gypsum Company.

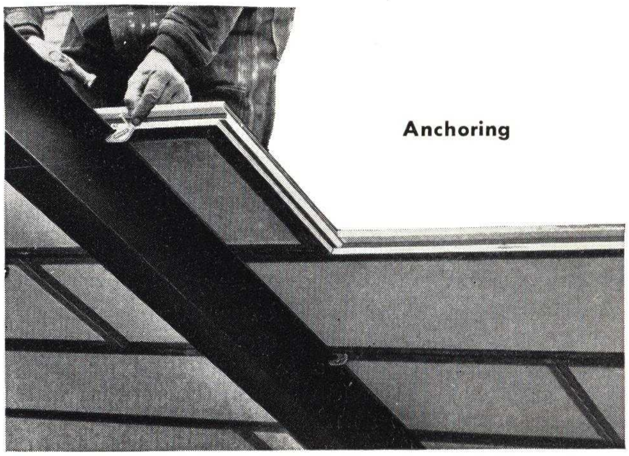
*Curb tile* shall be 3″ solid precast Gypsum Roof Tile, manufactured by United States Gypsum Company.

### ERECTION

Start laying plank at one corner of each independent area.

All plank shall be laid dry with marked side up and with the GROOVE side advancing. Plank shall be placed on supporting roof steel with joints tightly interlocked.

Where no wall supports are provided along the longitudinal edge of the starting and final rows of plank, plank in these rows shall be cut so that end joints occur over roof supports. (When supports are provided along the wall, end joints may occur off the supports.)



Anchoring

End joints in adjacent rows shall be staggered not less than 30 inches. Alternate rows shall be started with full units or cut pieces long enough to have bearing at not less than two supports. Ends of rows shall be finished similarly. The remaining rows can be started (or finished) with cut plank long enough to have not less than one support.

Each plank shall be anchored to the supporting steel, using one clip at every point of support. Where possible, alternate position of clips so that each clip is facing in opposite direction to the next one. Each clip shall be secured to plank with 2 nails.

Cut plank to fit at walls, ridges, valleys and around openings as indicated or required.

All curbs, cants, drainage saddles, etc., shall be installed as indicated or required.

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* *Trademarks Reg. U. S. Pat. Off.*

AIA FILE NUMBER 4-E-6

TECHNICAL INFORMATION

# GYPSUM ROOF TILE

## THREE-INCH SHORT SPAN

## (NAILING TYPE)

**UNITED STATES GYPSUM**
The Greatest Name in Building

GENERAL OFFICES—300 WEST ADAMS STREET, CHICAGO 6, ILLINOIS

AIA FILE NUMBER 4-E-6

1955

# 3" SHORT SPAN (NAILING TYPE) GYPSUM ROOF TILE

## DESCRIPTION

3" Short Span (Nailing Type) Gypsum Roof Tile are precast, solid, reinforced gypsum roof deck units, usually supported by steel tee sub-purlins. A grouting groove along top edges is provided.

**Size**—3" x 12" x 30".

## FUNCTION AND UTILITY

**Nail-Holding Power.** These slabs are cast from a dense, hard gypsum, to give maximum nail-holding power in a low cost nailing type deck. (See Technical Data Tables for various nail holding values.)

**Fireproof.** Composed almost entirely of gypsum, these units will not burn or transmit high temperatures until completely calcined—a very slow process.

**Strong.** 3" Short Span (Nailing Type) Gypsum Roof Tile will safely support a load of over 100 pounds per sq. ft., uniformly distributed. The size of sub-purlins is usually determined by the design load which seldom exceeds 60 pounds per sq. ft. The sub-purlins, welded to roof members, give bracing strength and rigidity to the frame. See Technical Data for sub-purlin sizes.

**Light Weight.** Only 17 pounds per square foot exclusive of sub-purlins. Light dead load saves structural steel.

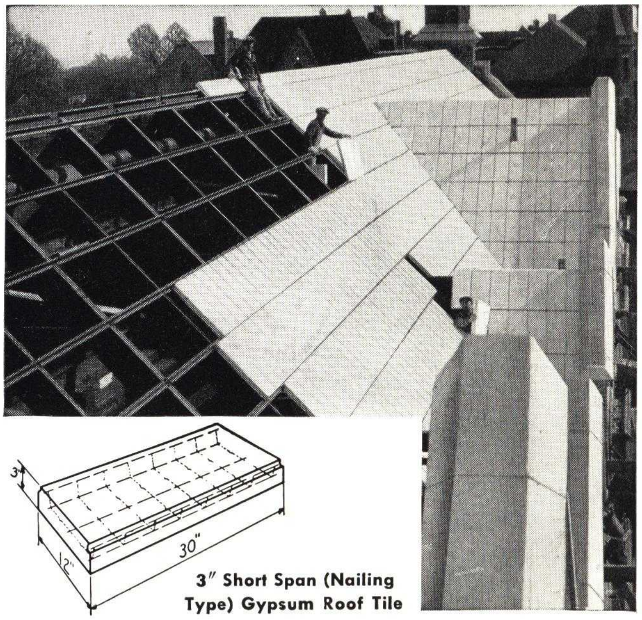
**Insulation Value.** With a resistance (R) factor of .42 per inch of thickness 3" Short Span Gypsum Roof Tile provides adequate insulation for normal requirements.

**Adaptable.**

(a) 3" *Short Span Gypsum Roof Tile* are designed especially for pitched roof decks but are adaptable to flat or slightly curved or warped surfaces as well.

(b) *Winter construction.* Since units are precast, requiring little grout (after deck is in place), many winter delays are avoided.

(c) *Speed of erection.* Convenient size and weight of tile make possible fast erection.



**3" Short Span (Nailing Type) Gypsum Roof Tile**

## LIMITATIONS OF USE

**1. Job Protection.** Store on edge, off the ground and cover to keep dry.

**2. Roof Covering.** Apply roof covering as soon as possible after installation of gypsum roof tile. See table of nail holding values, this page, for aid in selection to suit job requirements. Seamed type sheet metal coverings are applied with attachments (cleats or strips) anchored by bolting entirely through the roof deck.

**3. High Humidity—High Temperature.** 3" Short Span Gypsum Roof Tile are designed for use on buildings having normal humidity and temperature conditions. Where high humidity conditions, such as in wet processing plants, or where high temperatures prevail, such as in foundries, or near uninsulated furnaces or breechings, consult the nearest USG sales office for recommendations.

## VENTILATION OF ENCLOSED SPACES

All enclosed spaces beneath Roof Decks must be adequately ventilated to the outside as a means of avoiding condensation. This principle applies to all constructions whether installed wet or dry.

## TECHNICAL DATA TABLES

### NAIL HOLDING VALUES FOR 3" GYPSUM TILE

Resistance to direct pull in pounds per nail for penetration shown

| TYPE OF NAIL | La Belle Square Cut Nails (Wheeling) | | | | Tinnerman C-3459S-080 | Wire Nail |
|---|---|---|---|---|---|---|
| | 5 Penny | 6 Penny | | 7 Penny | Wire Clinch | 6 Penny |
| | Shingle | Common | Cornice | Common | Use With Tin Cap | Special |
| Finish | Galv. | Galv. | Galv. | Galv. | Galv. | Cement Coated |
| Lengths | 1¾" | 2" | 2" | 2¼" | 1¼" | 2¼" |
| Penetration | 1½" | 1¾" | 1¾" | 2" | 1" | 1¾" |
| Nail Holding Power in Pounds per Nail in Dry Tile | 150.5 | 267.0 | 273.0 | 323.0 | 121.0 | 175.0 |

NOTES:
1. Values shown are from tests conducted by USG Research Laboratory.
2. Nails were driven by hand with a hammer, then immediately withdrawn by means of a weighted lever arm.
3. The dry density of the gypsum tile was approximately 68 pounds per cubic foot.
4. The Tinnerman Wire Type Clinch Nail must be driven through metal discs to operate the clinching mechanism.

### STEEL SUB-PURLIN

SPACED 2'-6¾" O.C.* = 2'-7"
BASED ON TOTAL ROOF LOAD OF 55 POUNDS PER SQ. FT. AND M = 1/10 WL

| SUB-PURLIN | | Wt.—Lbs. | Wt.—Lbs. | Allowable Span Horizontal Projection —For Stress Shown | |
|---|---|---|---|---|---|
| Size and Description | Sec. Mod. in 3 | Per Lin. Foot Sub-Purlin | Per Sq. Foot Roof | 18,000 Psi. | 20,000 Psi. |
| 168 BULB T. (I) | .240 | 2.00 | .78 | 5'-0" | 5'-4" |
| 134 BULB T. (B) | .240 | 2.00 | .78 | 5'-0" | 5'-4" |
| 3134 BULB T. (W) | .240 | 2.00 | .78 | 5'-0" | 5'-4" |
| 178 BULB T. (B) | .294 | 2.40 | .94 | 5'-7" | 5'-11" |
| 3178 BULB T. (W) | .324 | 2.47 | .96 | 5'-10" | 6'-2" |
| 178 BULB T. (I) | .340 | 2.50 | .98 | 6'-0" | 6'-4" |
| 200 BULB T. (I) | .460 | 3.00 | 1.17 | 7'-0" | 7'-4" |
| 3218 BULB T. (W) | .472 | 3.01 | 1.18 | 7'-1" | 7'-5" |
| 214 BULB T. (B) | .510 | 3.20 | 1.25 | 7'-4" | 7'-9" |
| 2180 BULB T. (B) | .520 | 2.85 | 1.11 | 7'-5" | 7'-10" |
| 2140 BULB T. (B) | .6445 | 3.65 | 1.41* | 8'-3"* | 8 -8"* |

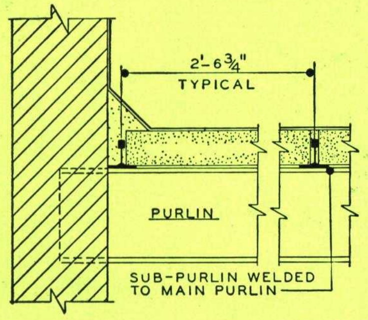
(I) Inland Steel Company, 38 S. Dearborn, Chicago 3, Illinois
(W) West Virginia Steel Co., Huntington, West Virginia
(B) Buffalo Steel Division—H. K. Porter Co. Inc., Tonawanda, N. Y.

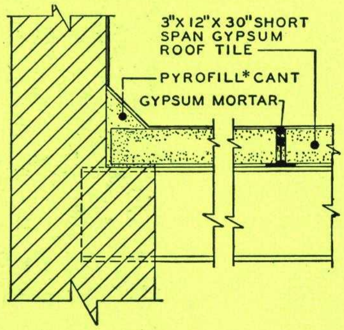
**"PYROFILL", and "PYROCELL*" are registered trademarks owned by United States Gypsum, used by it to distinguish its products.**
**"PYROFILL" and "PYROCELL" identify the particular gypsum fiber cements manufactured only by United States Gypsum.**

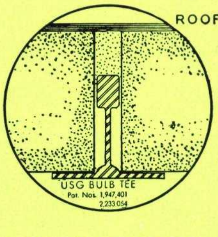
# 3″ SHORT SPAN (NAILING TYPE) GYPSUM ROOF TILE

## PARAPET & END WALLS:

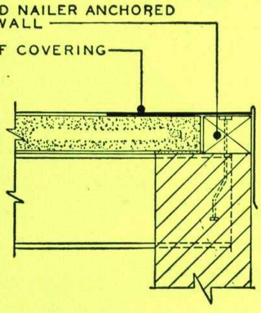
SCALE: 3/4″= 1′-0″





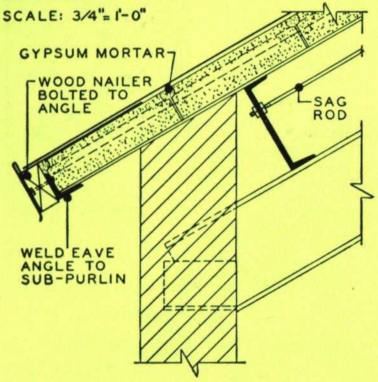


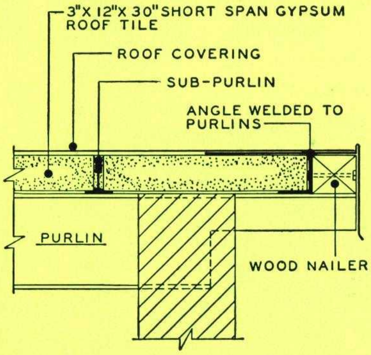
SUB-PURLIN ENLARGED



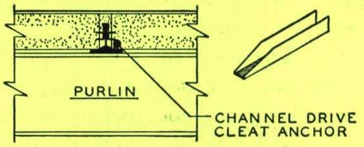
## EAVES:

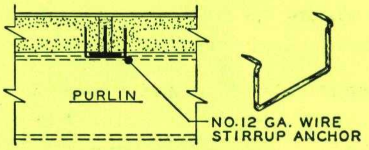
SCALE: 3/4″= 1′-0″

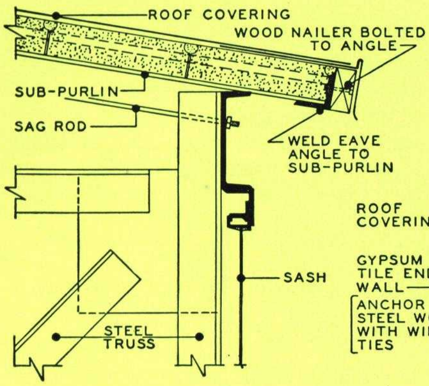


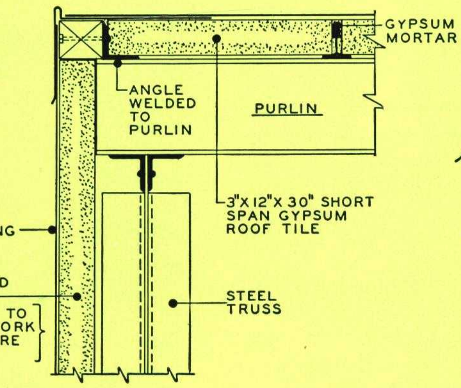


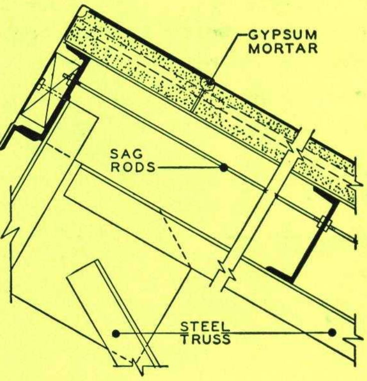
## ANCHORAGE





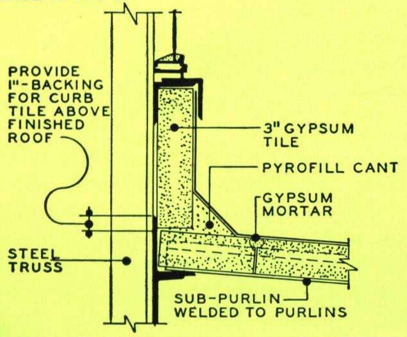




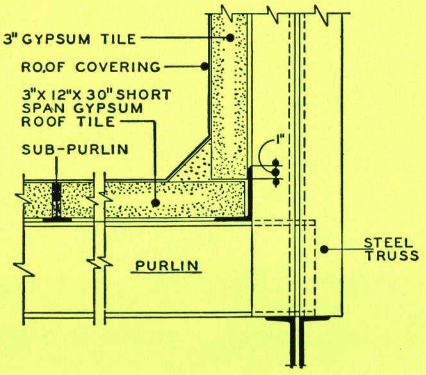


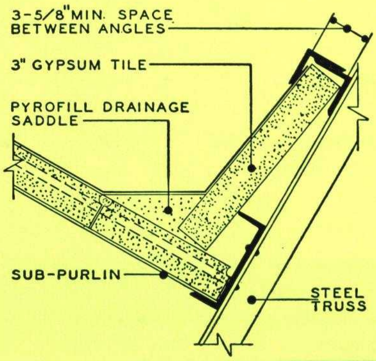
## CURBS:

SCALE: 3/4″= 1′-0″



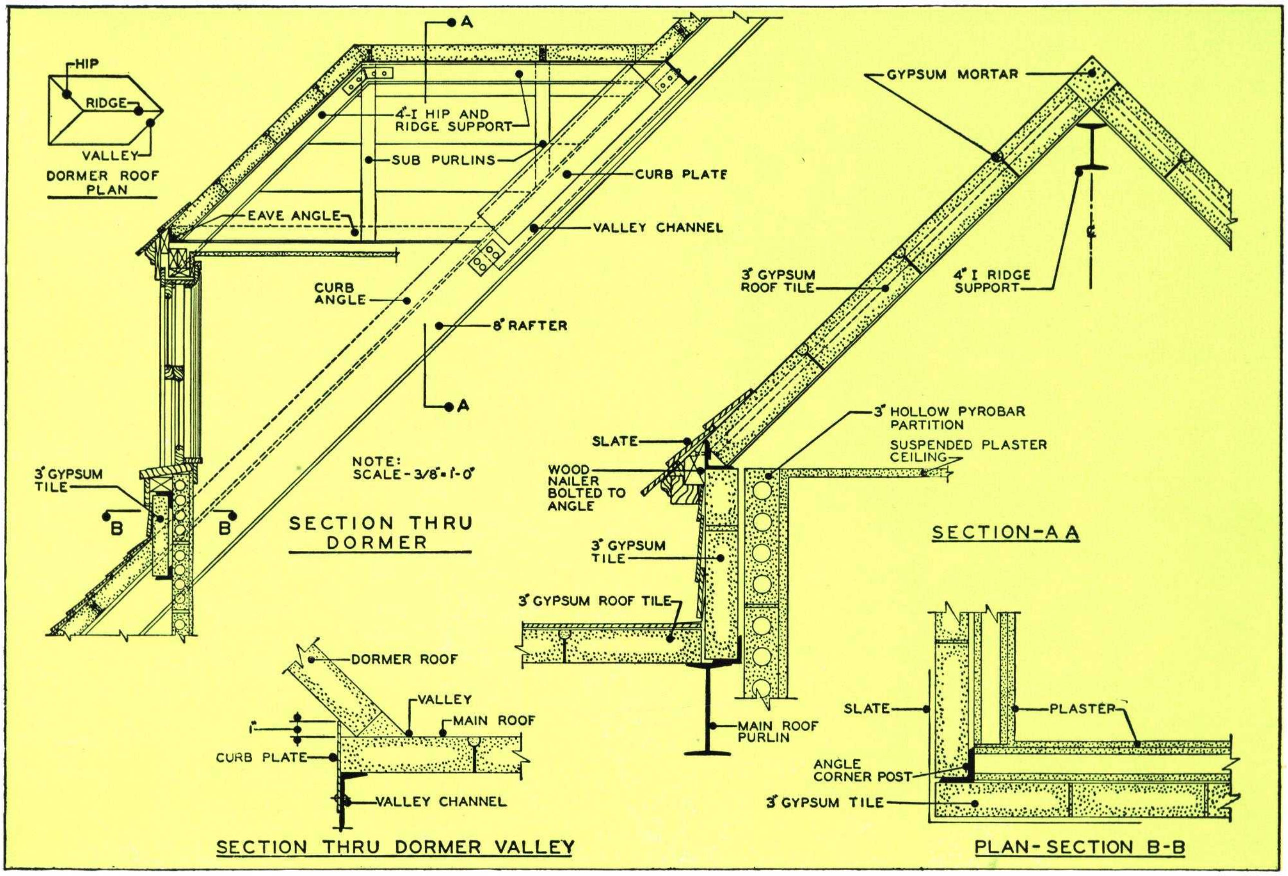
PROVIDE 1″-BACKING FOR CURB TILE ABOVE FINISHED ROOF
3″ GYPSUM TILE
PYROFILL CANT
GYPSUM MORTAR
STEEL TRUSS
SUB-PURLIN WELDED TO PURLINS





*Trademark Reg. U. S. Pat. Off.

# 3″ SHORT SPAN (NAILING TYPE) GYPSUM ROOF TILE



## SPECIFICATIONS

### SCOPE

Unless otherwise shown or specified, all roof areas are to receive 3″ solid short span precast reinforced gypsum roof tile complete with steel sub-purlins and gypsum grouting mortar. All curbs, cants and saddles are to be included as shown or required.

### MATERIALS

**Sub-Purlins**—Steel sub-purlins to be bulb tees or standard structural tee sections or required section modulus. (See table page 2.) All sub-purlins to have one shop coat of paint. Sub-purlins to be cut to length so that ends occur over supports.

**Roof Tile.** Shall be 3″ Short Span (Nailing Type) Gypsum Roof Tile, manufactured by United States Gypsum Company.

**Grouting Mortar.** To be United States Gypsum Company's Grouting Cement, sanded at the job site in the proportion of one part cement to two parts of clean, sharp sand, by volume.

**Curbs.** Shall be 3″ solid precast Gypsum Tile, manufactured by United States Gypsum Company.

**Cants and Saddles.** To be PYROFILL* or PYROCELL* gypsum fiber concrete, manufactured by United States Gypsum Company.

### ERECTION

**Sub-Purlins.** Place steel sub-purlins across main roof purlins at 30¾″ o.c. Weld each sub-purlin to main purlins with one weld at each intersection, using a ¾″ long fillet weld on alternate sides of sub-purlins where accessible. All ends of sub-purlins shall bear on roof supports.

**Roof Tile.** Place roof tile dry between sub-purlins with sides butted tightly together and with ends bearing equally on flanges. Cut tile to fit at all walls, curbs, ridges, hips, valleys and openings as required. Grout all joints from the top with gypsum grouting mortar. Fill flush to the top surface of the tile and cut off excess mortar. All roof areas to be clean and free of debris, ready to receive the weatherproofing specified elsewhere.

**Curbs.** Install curbs as shown on drawings. Tile to be laid in gypsum cement mortar and anchored to steel framing as required.

**Cants.** Shall be accurately formed to a line.

**Saddles, or drainage fills.** Shall be placed as shown and left smooth to receive roof covering.

### OPTIONAL INCLUSIONS

**1. For eaves, rakes, etc.** At all overhanging portions of roofs, such as eaves, etc., provide a 2½″ x 2½″ eave angle, welded to sub-purlins or out-lookers to provide a solid stop for roof tile. Provide wood nailers, bolted to eave angles, where shown or required.

**2. Where pitch of roof exceeds 45°,** 3″ Short Span Gypsum Roof Tile shall be secured to sub-purlins with special wire ties nailed into sides of adjacent tile and extending below and around the sub-purlin; or if bulb tee sub-purlins are used, steel wedges may be used in end joints between tile and web of sub-purlins. When pitch of roof exceeds 45°, consult nearest United States Gypsum sales office for recommendation on the application of slate, architectural tile, etc.

**Trademark Reg. U. S. Pat. Off.*

**TECHNICAL INFORMATION**

# USG STEEL

## ROOF DECKS

**UNITED STATES GYPSUM**
**The Greatest Name in Building**

**GENERAL OFFICES—300 WEST ADAMS STREET, CHICAGO 6, ILLINOIS**

1955

# USG STEEL ROOF DECKS

## DESCRIPTION

USG Steel Roof Decks are prefabricated units, formed by cold rolling low carbon steel sheets into ribbed type interlocking panels, ready for installation as they come to the job. USG Steel Roof Deck, ribbed panels, are made 18 inches wide, with nominally 1½″ deep ribs, and in standard lengths from 5′8″ to 27′ 2½″ inclusive. Each roof deck panel is shop painted by flow coating with a rust inhibitive zinc chromate paint oven dried.

USG Steel Roof Deck panels are available in either No. 18, No. 20 or No. 22 U. S. Standard gauges shop painted and in No. 18 or 20 gauge galvanized.

All essential accessories such as ridge and valley plates, cover plates, cants, curbs, sump pans or plates are also available in the same shop painted or galvanized steel as shown in detailed drawings.

USG Steel Roof Deck is manufactured in accordance with the Standards and Specifications of the Metal Roof Deck Technical Institute.

## FUNCTION AND UTILITY

**Light Weight:** USG No. 18 gauge painted steel roof deck, ribbed panels, weigh approximately 315 pounds per 100 sq. ft. of roof area, No. 20 gauge approximately 235 pounds, and No. 22 gauge approximately 200 pounds—galvanized slightly more. This light dead load permits savings in the structural steel framing.

**Strength:** All of the high strength of steel is used to advantage in the ribbed design of USG Steel Roof Decks. A stiffening bead is formed in the top flange between the ribs to resist warping or buckling under concentrated loads.

A table of safe total loads in pounds per sq. ft., the weight per square, the moment of inertia ($I''^4$), the section modulus ($S''^3$) and the insulation values, "U" for the complete roof including built up roof covering, is shown in the Technical Data at the bottom of this page.

**Fire Resistance:** USG Steel Roof Decks cannot burn or otherwise support combustion. For fire resistance ratings, see page three.

**Permanent:** The rust inhibitive, oven dried paint gives to USG Steel Roof Decks a normal life expectancy equal to that of structural steel. (Galvanized deck is supplied unpainted.)

**Adaptability:** USG Steel Roof Decks are ideal on flat, warped and low pitched roofs. Insulation and built-up roof coverings are required.

**Appearance:** The light gray painted surfaces of the deck plates and accessories, and the repeating rib pattern provide a pleasing light reflective undersurface.

**Maintenance:** The shop painted surfaces can be washed or repainted as maintenance requires.

**Low Cost:** Material costs are low. Speed of erection results in low labor costs. Light dead load conserves structural steel.

**Limitations of Use:** A rigid type of insulation is required over steel roof decks, under the built-up roof covering.

Special consideration must be given to the use of steel roof decks when they are exposed to:

1. Acid or acid fumes detrimental to paint or steel.
2. Excessive temperature.
3. Excessive moisture or humidity conditions.

For further information consult our nearest Industrial Sales Engineer, or Architect Service Representative.

## VENTILATION OF ENCLOSED SPACES

All enclosed spaces beneath Roof Decks must be adequately ventilated to the outside as a means of avoiding condensation. This principle applies to all constructions whether installed wet or dry.

### TECHNICAL DATA

| Type of Span | Ga. | SAFE TOTAL LOADS IN LBS. PER SQ. FT. — PURLIN SPACING 5′0″ | 5′6″ | 6′0″ | 6′6″ | 7′0″ | 7′6″ | 8′0″ | 8′6″ | 9′0″ |
|---|---|---|---|---|---|---|---|---|---|---|
| Continuous | 18 | 138 | 114 | 96 | 82 | 70 | 61 | 54 | 48 | 42 |
| | 20 | 102 | 84 | 71 | 60 | 52 | 45 | 40 | 35 | 31 |
| | 22 | 86 | 71 | 60 | 51 | 44 | 38 | 24 | 30 | — |
| Two Spans | 18 | 111 | 91 | 77 | 65 | 56 | 49 | 43 | 38 | 34 |
| | 20 | 82 | 67 | 57 | 48 | 42 | 36 | 32 | 28 | 25 |
| | 22 | 69 | 57 | 48 | 41 | 35 | 30 | — | — | — |
| Simple | 18 | 111 | 91 | 77 | 65 | 56 | 49 | 41 | 35 | 31 |
| | 20 | 82 | 67 | 57 | 48 | 42 | 36 | 31 | 26 | 23 |
| | 22 | 69 | 57 | 48 | 41 | 35 | 30 | — | — | — |

**PROPERTIES**

| Type | Wt. Lbs. Per Sq. Black | Galv. | $I''^4$ | $S''^3$ |
|---|---|---|---|---|
| 18 ga. | 315 | 345 | .277 | .230 |
| 20 ga. | 235 | 265 | .195 | .170 |
| 22 ga. | 200 | — | .156 | .143 |

**Insulation—"U" Value**

Btu/sf/°F—INCLUDING ROOFING

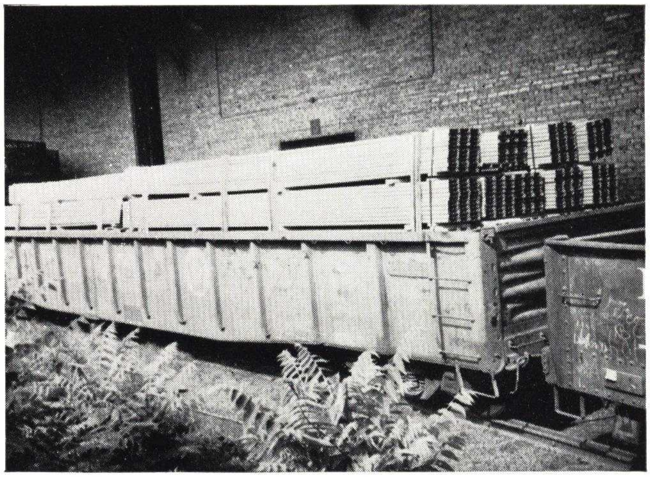
| None | ½″† | 1″† | 1½″† |
|---|---|---|---|
| 0.94 | 0.39 | 0.24 | 0.18 |

†Fiberboard Insul—K=.33 over steel deck

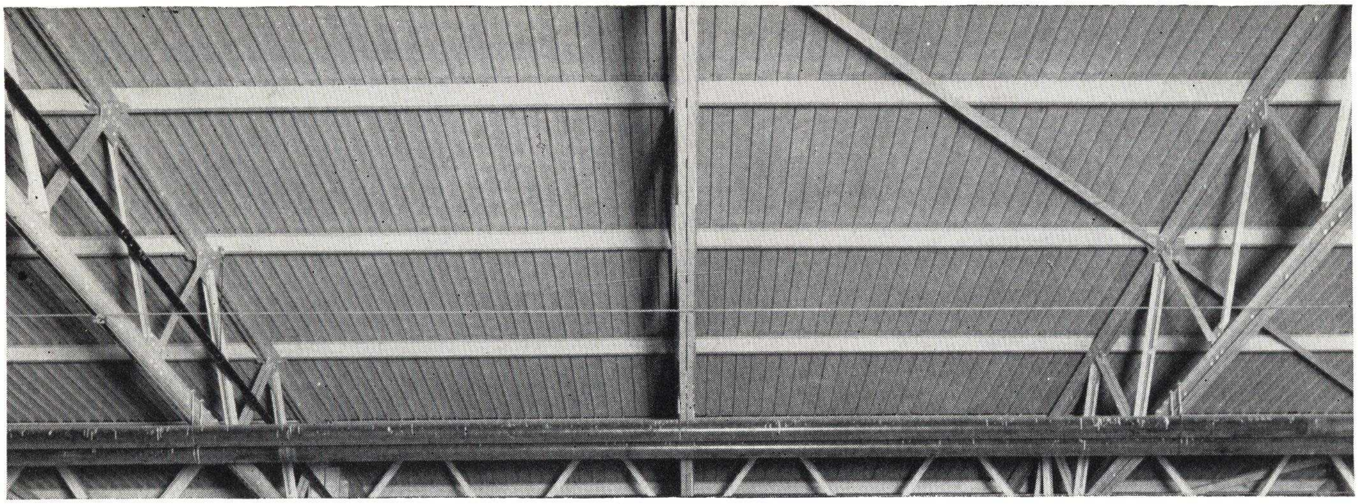
NOTE: None of these loads will produce a stress greater than 18,000 psi or a deflection due to live load greater than 1/240 of the span. A 6 psf dead load representing the weight of the deck, insulation, roofing, etc., was subtracted from total loads when determining deflections. In accordance with specifications of the Metal Roof Deck Technical Institute:

(a) Only ¾ of the width of the top compression flange for 18 gauge, ⅝ for 20 gauge and ½ for 22 gauge have been used as being effective in resisting bending.
(b) A moment coefficient of 1/10 has been used for 3 or more spans, and ⅛ for two spans and simple span.
(c) A deflection coefficient of 3/384 has been used for all except simple spans, and 5/384 for simple spans.

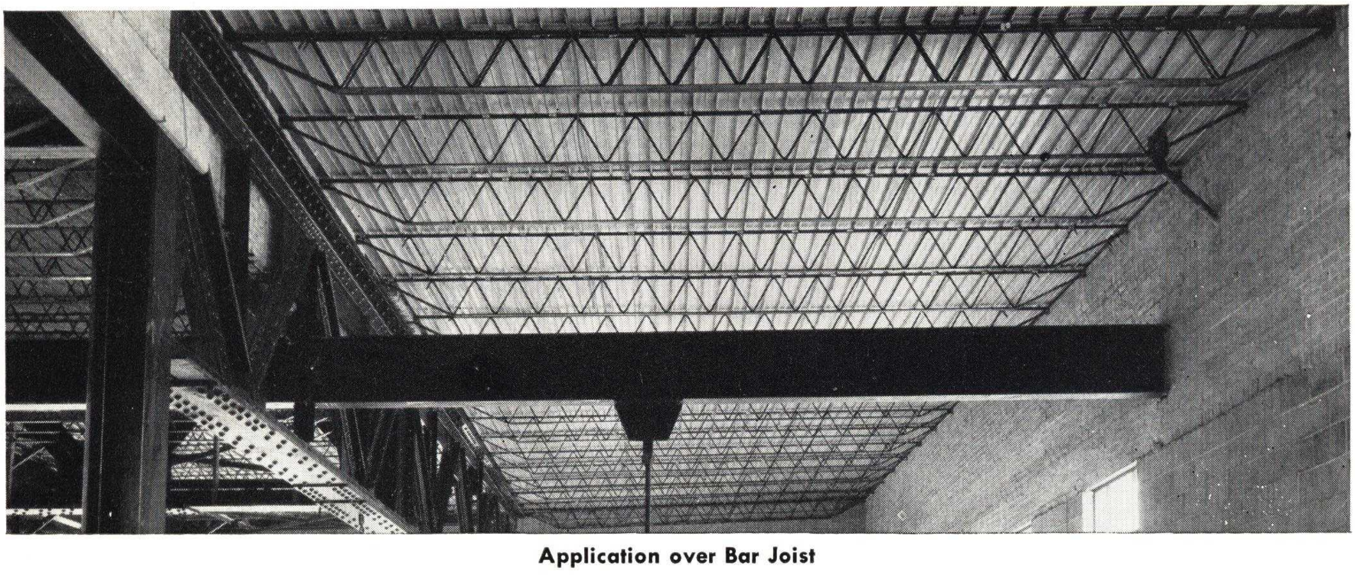
# USG STEEL ROOF DECKS



**UNITIZED LOADING** is a service offered with USG Steel Roof Deck. This feature reduces material handling costs on the job and reduces the possibility of damage to the shape or surface of the deck while being placed.



Application over Steel Beams

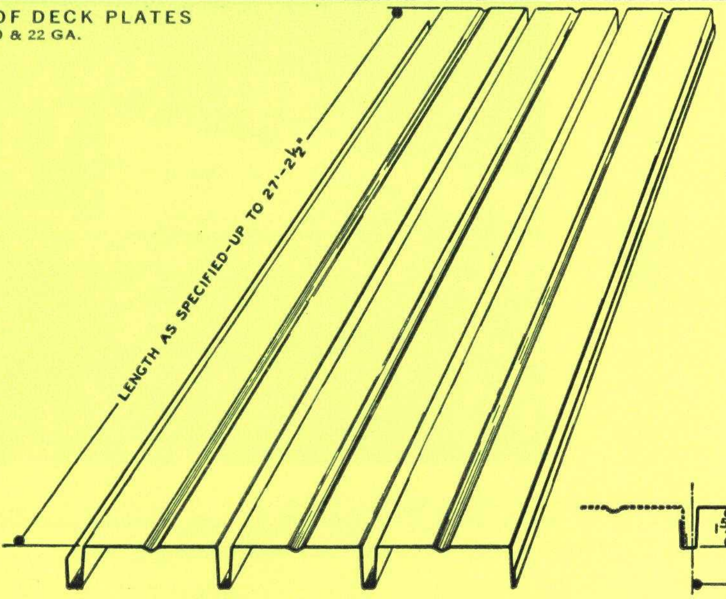


Application over Bar Joist

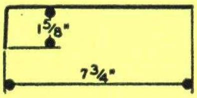
# USG STEEL ROOF DECKS

## ROOF DECK PLATES

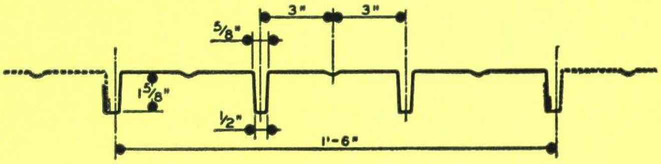
18, 20 & 22 GA.



STANDARD STEEL
ROOF DECK PLATE



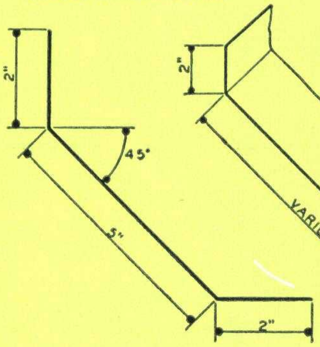
FILLER PLATE



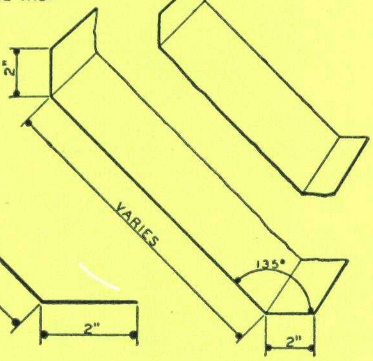
TYPICAL CROSS SECTION
THRU ROOF DECK PLATE

## ACCESSORIES

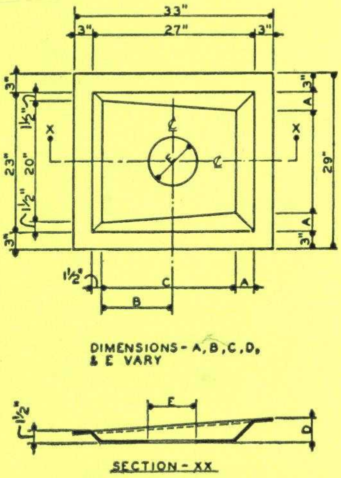
MAX. FAB. LENGTH 10'-0"
UNLESS OTHERWISE IND.



METAL CANT STRIP
20 GA.



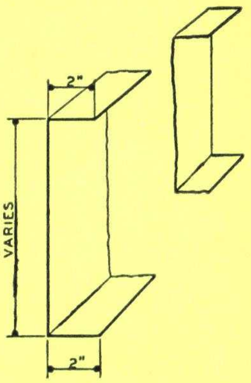
CANT SADDLE
18 & 20 GA.



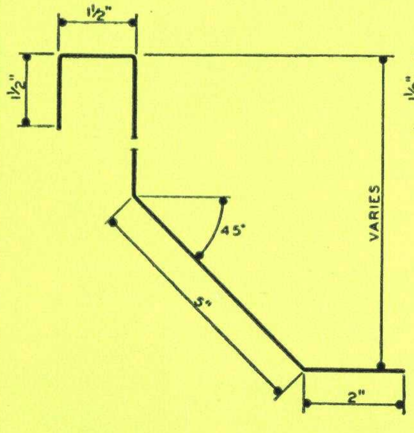
DIMENSIONS - A, B, C, D, & E VARY

SECTION - XX

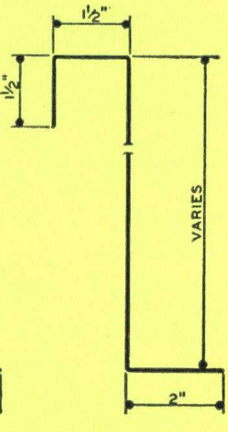
SUMP PAN – RECESS TYPE
14 GA.



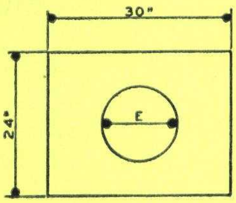
TAPERED SADDLE CHAIR
18 GA



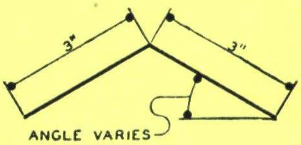
METAL CANT CURB
18 GA.



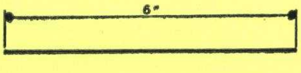
METAL CURB PLATE
18 GA.



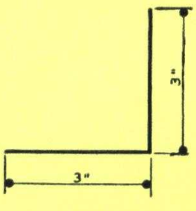
SUMP PLATE
14-GA.



RIDGE OR VALLEY PLATE
20 GA.



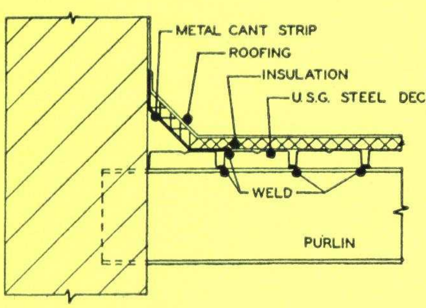
COVER PLATE
20 GA.

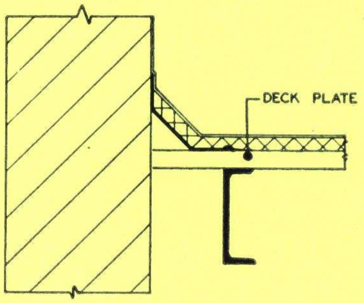


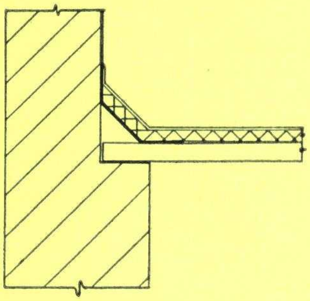
UTILITY ANGLE
20 GA.

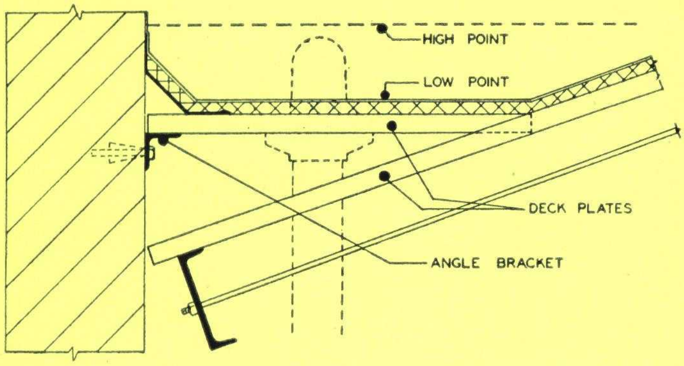
# USG STEEL ROOF DECKS

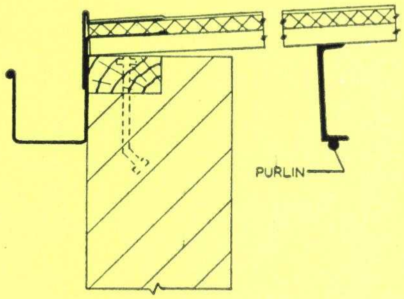
## PARAPET AND END WALL DETAILS



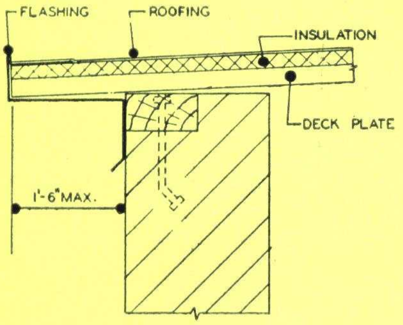


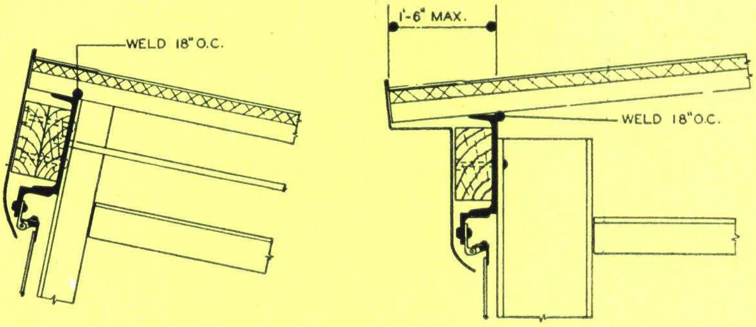




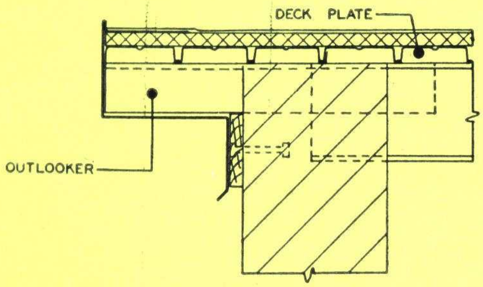


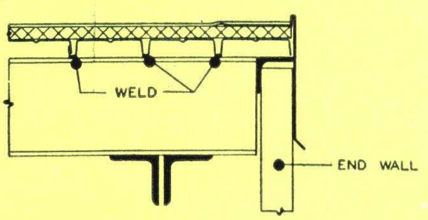
## EAVE AND GABLE DETAILS





SAWTOOTH EAVE

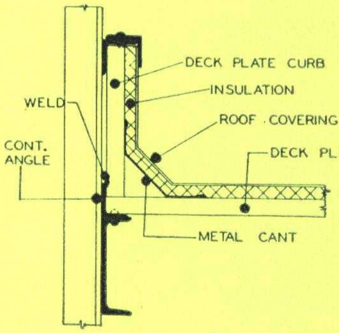


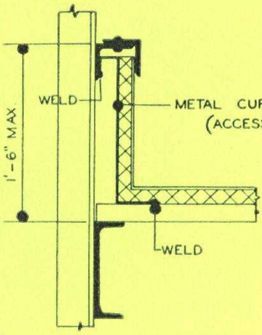


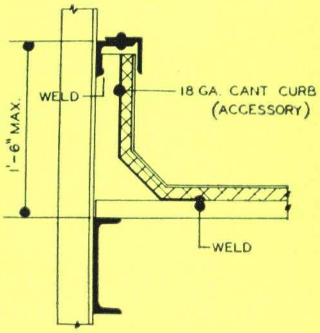
MONITOR END WALL

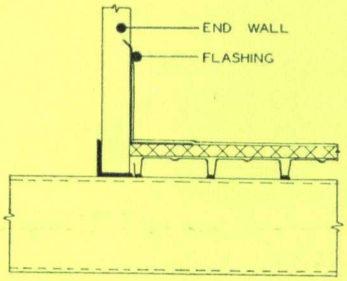
SCALE ¾" = 1'-0"

## CURB DETAILS

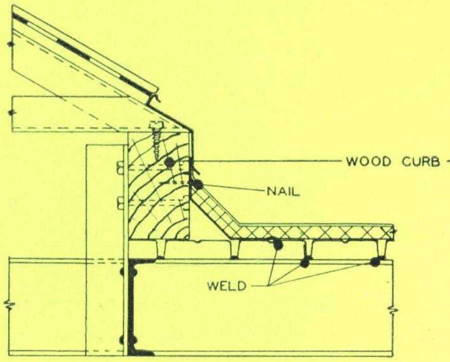




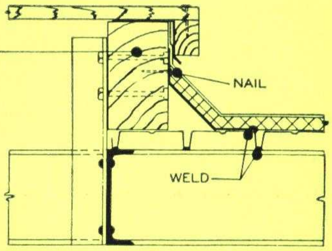




MONITOR END WALL

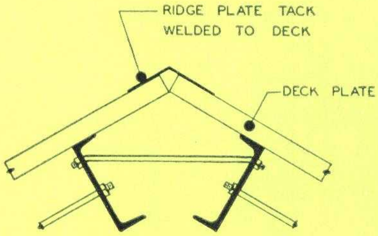


SKYLIGHT DETAIL

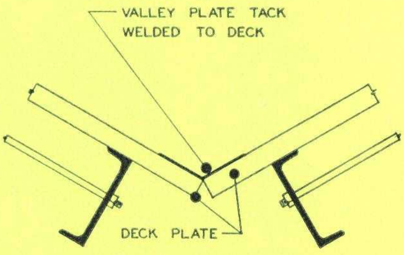


SCUTTLE DETAIL

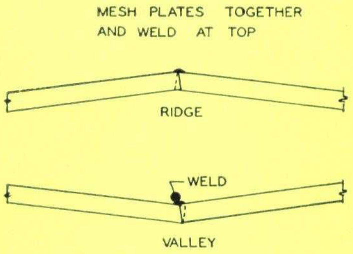
## MISCELLANEOUS DETAILS



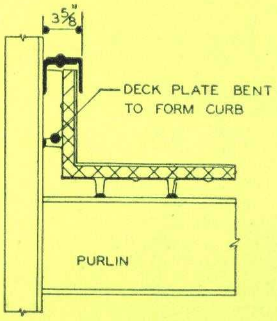
RIDGE DETAIL



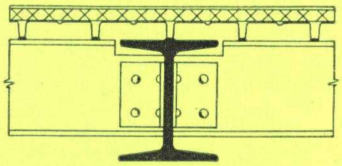
VALLEY DETAIL



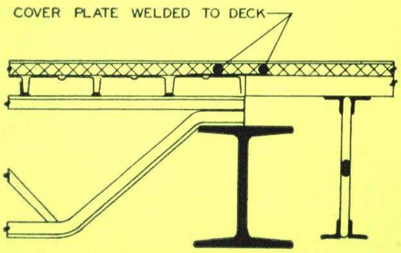
WHERE SLOPE IS LESS THAN
1½" PER 1'-0"



ALTERNATE CURB DETAIL

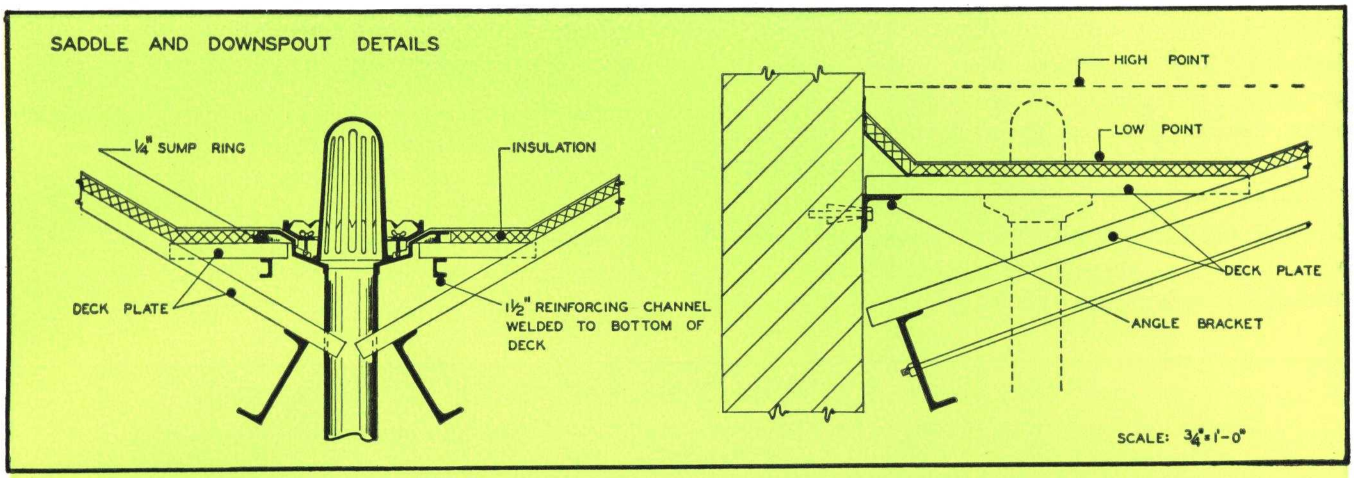


NOTE: PURLINS SHOULD BE FRAMED TO BEAM SO THAT FLANGES ARE FLUSH TOP

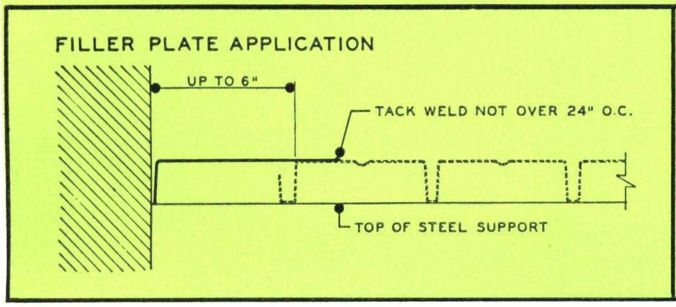


DETAIL SHOWING CHANGE OF DIRECTION OF JOISTS

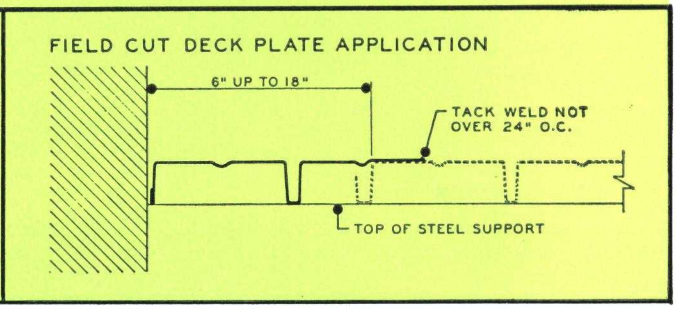
SCALE ¾" = 1'-0"



SADDLE AND DOWNSPOUT DETAILS

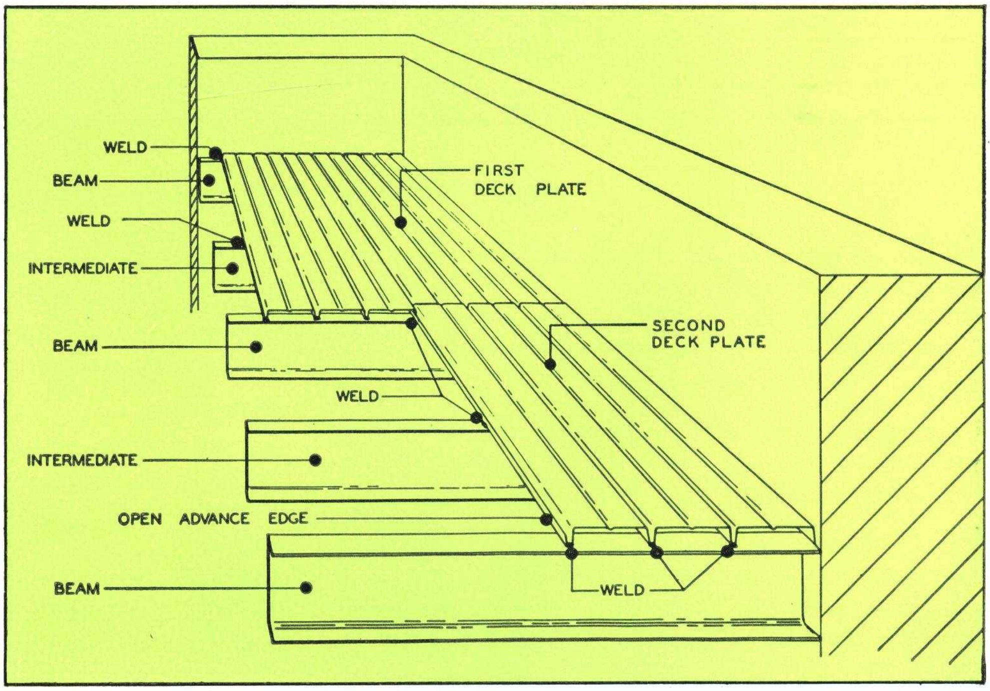


FILLER PLATE APPLICATION



FIELD CUT DECK PLATE APPLICATION

## DIRECTIONS FOR WELDED APPLICATION



Placing diagram showing the number, length and locations of roof deck plates and accessories should be made for each installation. This placing diagram, together with a bill of materials, will be prepared by U.S.G. if complete plans and specifications are furnished for the purpose. The customer may prepare his own shop drawings and bill of materials, if he prefers.

USG Steel Roof Decks shall be installed in accordance with the placing diagram. Otherwise, shortage of some sizes and overage of others may result.

**FIRST**—Start placing roof deck plates at the low point, usually in a corner at the end of the building. Place the first plate with the open channel flange advancing. Weld the plate to the supporting steel with one weld at each rib at the ends and one weld at each intersection of the advancing side with intermediate purlins. Lay the second plate in the starting row, overlapping the ends at the joint not less than 2″ and mesh completely. Weld each rib of the advancing end and the side at each intermediate purlin. Continue placing and welding plates in the first row in like manner well in advance of succeeding rows.

**SECOND**—Start placing the second row of plates beginning at the original starting point, place the straight flange into the open channel flange of the first plate and adjust to make a full contact of the joining flanges. Weld the ends at each rib and the advancing side of each plate at each intersection with intermediate purlins.

**THIRD**—Continue placing plates in succeeding rows in like manner, keeping each row in advance of the following row to facilitate lapping and meshing of the plates together over purlins.

**FOURTH**—Close last row by: (a) cut standard 18″ wide deck plates lengthwise in the field allowing from 2 to 3 inches overlap on preceding plate. Weld ends of ribs at purlins and also weld overlaps to preceding deck plate not more than 24″ on centers, or (b) install filler plates (furnished by United States Gypsum Company) overlapping the preceding plate as required and weld to the preceding steel roof deck plate with welds not more than 24″ on centers.

# USG STEEL ROOF DECKS

**FIFTH**—Install accessories as follows:

**USG Steel Roof Deck Plates** used as curbs and saddles are to be installed in substantially the same manner as previously described for the roof proper, except that welds are to be made on the top of the plates when ends of ribs are inaccessible.

**Sheet Metal Accessories**—Install cant strips, ridge and valley plates, cover and closure plates, curbs, utility angles, sump plates, etc., as indicated on the drawings by welding to the supports with welds not more than 24″ on centers and staggered on opposite sides where possible.

**Insulation Anchorage**—Where roof pitch is 3″ to 12″ and over, install pronged type clips in the rib openings. Clips are to be spaced not more than 18″ on centers in the direction of the width of the roof deck plates and not more than 36″ on center in the direction of the length of the roof deck plates, i.e. not less than one clip anchor for each 4.5 square feet of sloped roof deck area.

## FIRE-RESISTANCE RATINGS—STEEL ROOF DECK CONSTRUCTION

*Summary of the results of a series of fire-tests conducted at National Bureau of Standards—Washington, D. C.*

| Roof Materials Applied Over Steel Roof Deck | Suspended Ceilings of Metal Lath & Plaster | Fire Resistance Rating | Authority |
|---|---|---|---|
| **(a)** 2″ Vermiculite concrete (or equivalent) | 1″ Vermiculite—gypsum plaster on metal or wire lath | 4 hrs. | National Bureau Standards Test No. 60, 1/31/49 Report No. TR 10235-2FP 2688 |
| **(b)** Minimum 1¾″ insulation board of shredded wood, bonded with portland cement | 1″ Vermiculite—gypsum plaster on metal or wire lath | 3½ hrs. | |
| **(c)** Minimum 1″ insulation as described in item (b) above | 1″ Vermiculite—gypsum plaster on metal or wire lath | 3 hrs. | |
| **(d)** Minimum 1″ insulation board of felted glass fiber | 1″ Vermiculite—gypsum plaster on metal or wire lath | 2 hrs. | |
| **(e)** Minimum 1½″ wood fiber board insulation | 1″ sanded gypsum plaster 1:2 mix | 2 hrs. | N.B.S. Test No. 58 11/29/46 |
| **(f)** Minimum 1½″ wood fiber and cement binder insulation | ⅞″ sanded gypsum plaster 1:2 mix | 2 hrs. | N.B.S. Test No. 56 11/27/45 |
| **(g)** Minimum 1″ wood fiber board insulation | ¾″ sanded gypsum plaster 1:2, 1:3 mix | 1½ hrs. | N.B.S. Test No. 59 1/15/46 |

## ARCHITECTURAL SPECIFICATIONS

**General**—All principal roof framing, including trusses, purlins, beams, framing around openings larger than 12″ in diameter, and all trimming at curbs, sills, and walls, will be done by others. See Specifications for Structural Steel.

### SCOPE

Unless otherwise specified, all roof areas are to be covered with USG Steel Roof Deck. All deck is to be left complete, ready for application of the roof insulation and built-up roofing.

### MATERIALS

**Roof Deck Plates**—Shall be of (No. 18) (No. 20) (No. 22) gauge steel having nominal 1½″ deep ribs, 6″ on centers, and made in units 18″ wide by lengths to fit purlin spaces and shall be manufactured by United States Gypsum Company.

**Accessories**—All cant strips, ridge and valley plates, utility angles and cover plates, etc., as indicated, shall be 20 gauge steel fabricated to sizes and shapes indicated and shall be manufactured by United States Gypsum Company.

**Curbs**—Shall be of (No. 18) (No. 20) (No. 22) gauge steel (Roof Deck Plates) (Sheets formed to sizes and shapes indicated).

**Optional**—Sump Plates where indicated shall be fabricated of 14 gauge steel sheets according to manufacturers' standards.

**Paint**—All USG Steel Roof Deck plates and sheet metal accessories, etc., are to have one coat of rust inhibitive zinc chromate paint, applied at the factory and oven dried.

### ERECTION

All USG Steel Roof Deck plates and accessories are to be installed by welding in accordance with directions and placing diagrams furnished by the manufacturer, or steel deck contractor.

**Optional**—For use of clips in lieu of welding:

All USG Steel Roof Deck plates and accessories shall be installed with clips in accordance with directions and placing diagrams furnished by the manufacturer, or steel deck contractor.

### Notes to Architect:

1. When USG Steel Roof Deck is installed by welding, it may also be advisable to use spacer wedges. When pitch of roof is more than 3″ rise to 12″, anchorage clips for insulation are recommended.
2. Galvanized steel decks (unpainted) No. 18 or No. 20 gauge are available on specification.

TECHNICAL INFORMATION

# USG* SHEATHING

## WITH THE ASPHALTED GYPSUM CORE

**UNITED STATES GYPSUM**
The Greatest Name in Building

GENERAL OFFICES—300 WEST ADAMS STREET, CHICAGO 6, ILLINOIS

1955

*T. M. Reg. U. S. Pat. Off.

# USG* SHEATHING

## DESCRIPTION

USG Sheathing is a fireproof gypsum sheathing material. It is made in large unit sheets ½″x 2′x 8′ with a new type water-resistant "asphalted" gypsum core enclosed in a specially treated, water-repellent, heavy black paper. The long edges are V-tongued and grooved.

## FUNCTION AND UTILITY

**Fireproof**—The gypsum core is incombustible and will not transmit high temperatures until completely calcined—a slow process.

**Resistance to Weather and Moisture**—The gypsum in the core is thoroughly inter-mixed with asphalt type emulsion and the tough paper covering is given a special water-repellent treatment. This combination provides an amazing resistance to weather and makes possible open storage on the job, and exposure on the framing during construction without appreciable loss of structural value. It does not warp or buckle. (See technical data for vapor permeability.)

**Adds Structural Strength**—Wet or dry, USG Sheathing provides unusual lateral bracing to the frame. (See technical data.)

**Wind-Tight Joints**—The precision formed, interlocking V-tongue and groove edges snugly fitted, minimize wind infiltration.

### Economical

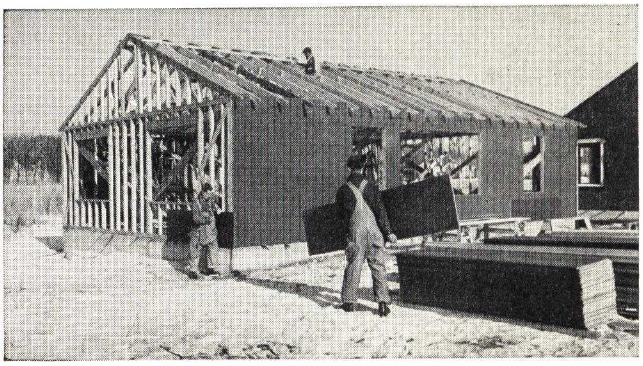
a. Low material cost.
b. Full dimension—no face loss.
c. Minimum of waste—sheets fit standard 16″ or 24″ stud spacing.
d. Fast application—up to 1000 sq. ft. can be applied by one man in eight hours.
e. Eliminates building paper except where required by local building regulations.

## STANDARD SPECIFICATIONS

USG Sheathing complies with the following standard specifications for gypsum sheathing board:

Federal Specification SS-S-276.

American Society for Testing Materials Standard Specification A.S.T.M. C79-52, for core-treated, water repellent gypsum sheathing.



**USG Sheathing being applied to wood frame house**

The following legend appears on the center of the back surface of each board:

"Gypsum, water repellent sheathing complying with A.S.T.M. specifications C79-52."

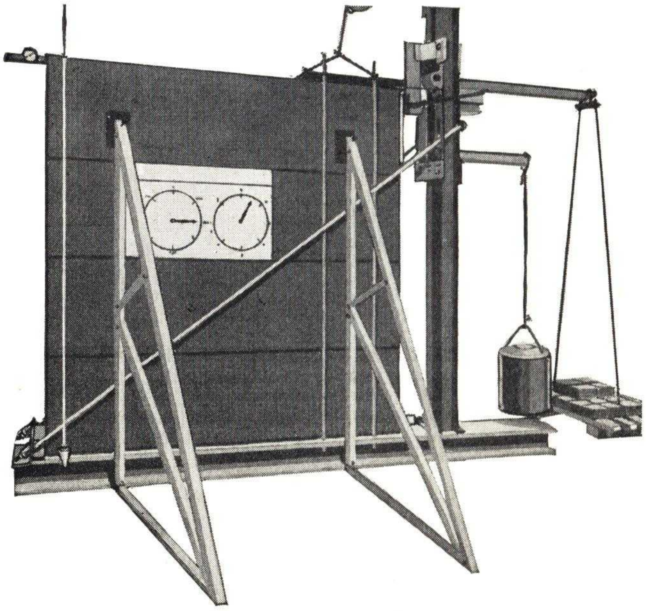
## LIMITATIONS OF USE

### 1. Maximum Stud Spacing

USG Sheathing is designed for use on stud centers up to 24″.

### 2. Attachment of Exterior Finishes

Wood siding, wood furring strips, metal lath, wall ties, etc., shall be secured to the framing members by nailing through the USG Sheathing.



**USG Sheathing Panel in Lateral Distortion Machine**

**Load of 1850 lbs. applied at upper right hand corner of 8′x8′ Test Pane**
**Lateral distortion on Dry Panel—.498 inch**
**Lateral distortion on Wet Panel—1.125 inches**

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**"USG" and "SHADOW-LOCK" are registered trademarks owned by United States Gypsum and used by it to distinguish its products. "USG" identifies the particular gypsum board sheathing, "SHADOW-LOCK" identifies the particular attachment system for asbestos shingles manufactured only by United States Gypsum.**

**Trademark Reg. U. S. Pat. Off.*

# USG SHEATHING

## TECHNICAL DATA

### 1. STRENGTH TO RESIST LATERAL DISTORTION

Comparative tests were conducted in USG Research Laboratories and attested by Phil C. Huntly, Consulting Engineer. Tested dry, USG Sheathing applied to an 8′x8′ panel of 2″x4″ framing on 16″ centers had a lateral distortion of .498″ under a racking load of 1850 lbs.

A similar panel was subjected to the equivalent of 5½ years of average United States rainfall in a giant "weatherometer" and with the same load of 1850 lbs. the distortion was only 1.125 inches.

Under this same load a similar frame sheathed with 1″x8″ dry wood sheathing resulted in a distortion of 10.312 inches.

### 2. INSULATION

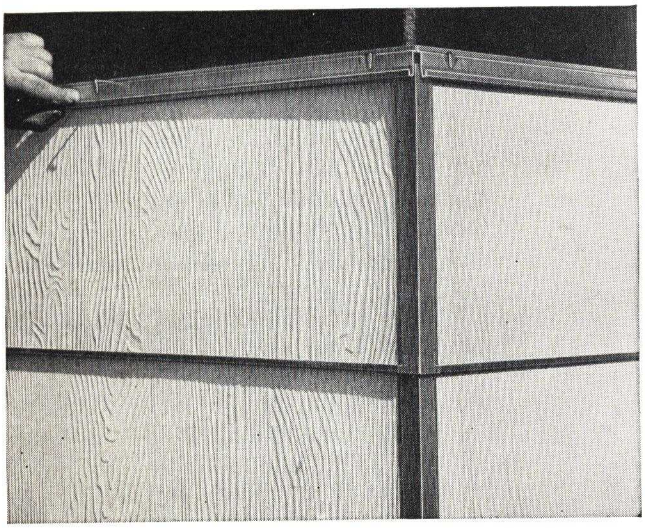
Thermal conductance is 2.86 and thermal resistance is 0.35, both for ½″ thickness.

### 3. VAPOR PERMEABILITY

USG Sheathing has an average permeability of 27.3 perms. (One perm equals 1 grain per sq. ft. per hour per inch of mercury vapor pressure difference.)

## SHADOW-LOCK ATTACHMENT SYSTEM

**Description**—USG Shadow-Lock Attachment System is a means of attaching asbestos cement siding directly over USG Sheathing with precision-made aluminum channels and corner pieces. This method of attachment creates a striking deep shadow line not obtainable with regular nail on attachment, minimizes shingle breakage because nails do not penetrate the siding, and is economical because it is self-aligning and uses 5% less siding.

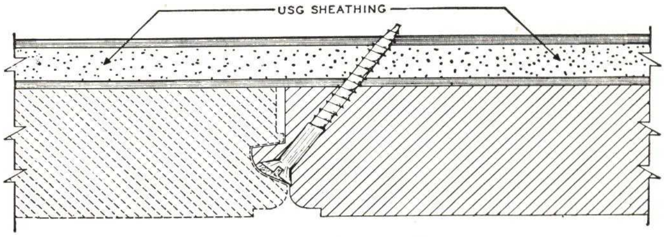


Application of USG Shadow-Lock Attachment System.

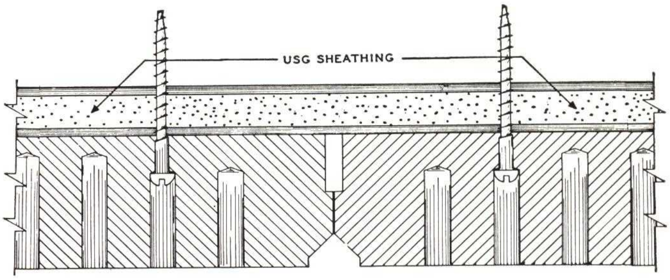
## USE OF USG SHEATHING AS A BASE FOR ACOUSTICAL TILE

USG Sheathing is an excellent incombustible backing for acoustical tile, applied either adhesively or mechanically. When so used, USG Sheathing must be erected at right angles to framing members and nailed 7″ on centers for 16″ spacing of supports, and 5″ on centers for 24″ spacing of supports. It may be nailed to Jackson or Pomeroy bars, or to wood framing.

### Wood Fiber Acoustical Tile Applied with Wood Screws

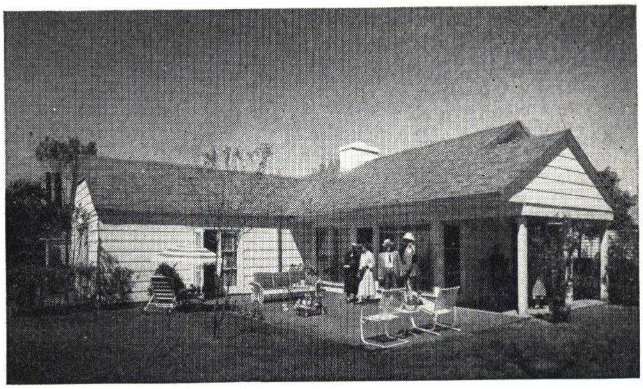


Tongue and Groove Tile.



Beveled Edge Tile.

Use No. 5 or No. 6 wood screw, 1½″ long for 1″ tile, 1¼″ long for ¾″ tile.



A Finished Home on which USG Shadow-Lock System was used.

# USG SHEATHING

## SPECIFICATIONS FOR USG SHEATHING

### SCOPE

Unless otherwise shown on plans, all exterior walls shall be sheathed according to these specifications.

### MATERIALS

**Sheathing** shall be USG Sheathing as manufactured by the United States Gypsum Company, ½″ x 24″ x 8′0″. **Nails** shall be galvanized, 7/16″ head diameter, 1¾″ long roofing nails, having No. 11 gauge barbed shanks.

### APPLICATION

Apply USG Sheathing with the long dimension across the supports and with the groove edge down, interlocking the tongue and groove edges. Ends of sheets shall abut over centers of supports, and all end joints shall be staggered. Fit snugly around all window and door openings. Secure sheathing to studs with nails spaced approximately 4″ on centers, 7 nails per 24″ sheathing width per support except (1) where exterior finish is secured to the frame with nails driven through the sheathing and into the studs, in which case nails shall be spaced approximately 8″ on center 4 nails per 24″ sheathing width per stud, and (2) when diagonal bracing is used with masonry, nail spacing may be 6″ o.c. 5 nails per support.
Starter nails shall be not less than ⅜″ from edges or ends of sheathing.

### OPTIONAL INCLUSIONS

#### 1. Use of Wood Siding Over USG Sheathing

Apply siding directly over USG Sheathing, securing it with nails driven through sheathing and into studs. Nails shall have a minimum penetration of 1¼″ into the studs. End joints of siding shall be over centers of studs.

#### 2. Use of Masonry Veneer Over USG Sheathing

Masonry ties shall be attached with nails driven through the sheathing and into the studs, using nails of sufficient length to penetrate 1¼″ into the studs. (At least 6d common nails.) Ties shall be spaced vertically to conform with coursing of masonry veneer.

**3. Use of Stucco over USG Sheathing**—Stucco may be applied over USG Sheathing by the use of self-furring 3.4 lb. USG Diamond mesh lath nailed with large headed nails of sufficient length to provide at least 1¼″ penetration into studs. See Sweet's catalog or AIA file 20-B-1.

#### 4. Use of Asbestos-Cement Siding Over USG Sheathing

USG SHADOW-LOCK Attachment System is a new method for attaching asbestos cement siding directly over USG Sheathing with precision made aluminum channels and corner pieces. This method of attachment creates a deeper and more beautiful shadow line than obtainable with usual application.

## SPECIFICATIONS FOR USG SHADOW-LOCK ATTACHMENT SYSTEM (Short Form)

### SCOPE

Unless otherwise shown on plans, straight edge asbestos cement siding shingles shall be applied to all exterior walls over gypsum sheathing and held in place by means of the USG SHADOW-LOCK Attachment System.

### MATERIALS

**Channels** shall be USG SHADOW-LOCK Channels 8′ long and 1″ wide as manufactured by the United States Gypsum Company.

**Corners** shall be USG SHADOW-LOCK Corners 11½″ long as manufactured by the United States Gypsum Company.

**Nails** shall be USG SHADOW-LOCK Nails 12 gauge galvanized 1¾″ long, with a diamond point and ⅝″ hook head.

### APPLICATION

The channels, corners and straight edge asbestos shingles shall be applied and secured in strict accordance with the recommendations of the manufacturer of the attachment system.

#### 5. Use of Wood Fiber Acoustical Tiles Over USG Sheathing

USG Sheathing makes an excellent base to which acoustical tile may be either adhesively or mechanically attached. If the tile is to be adhesively attached, the recommendations of the manufacturer of the tile and adhesive should be followed. The USG Sheathing, however, should be secured as described in the illustrations on preceding page.

### NOTE TO ARCHITECT

#### 1. Federal and A.S.T.M. Specifications

USG Sheathing complies with Federal Specifications for Gypsum Sheathing Board. SS-S-276 and A.S.T.M. (American Society for Testing Materials) Standard Specifications, A.S.T.M. Designation: C79-52 for core-treated, water repellent gypsum sheathing.

AIA FILE NUMBER 20-B-2

TECHNICAL INFORMATION

# ROCKLATH*

## PLASTER BASES
## ATTACHMENT SYSTEMS
## PARTITION CONSTRUCTIONS

**UNITED STATES GYPSUM**
The Greatest Name in Building

GENERAL OFFICES—300 WEST ADAMS STREET, CHICAGO 6, ILLINOIS

1955

*T. M. Reg. U. S. Pat. Off.

AIA FILE NUMBER 20-B-2

# ROCKLATH* PLASTER BASES

## DESCRIPTION

Rocklath plaster base is a gypsum lath made in sheet form providing a rigid base for the economical application of gypsum plasters. It is composed of a special gypsum core, faced on the sides and long edges with paper specifically manufactured for this purpose.

**Complies with:** ASTM Designation C37-50 and Fed. Spec. SS-P-431a

## FUNCTION AND UTILITY

**Fireproof**—When used with gypsum plasters Rocklath plaster bases provide fire ratings as shown in the technical data tables.

**Strength**—Gypsum plaster adheres to Rocklath with a strong bond. A pull of 864 lbs. per sq. ft. is required to separate the plaster from the lath, providing a safety factor of 144. The large sheets when plastered add appreciable distortion resistance to the frame.

**Durability**—Gypsum is a mineral not affected by time, decay, dry rot or normal humidity conditions. Does not attract vermin.

**Economy**—Rocklath is low in cost, has general market acceptance, is quickly and easily applied and permits substantial savings in plastering materials and labor.

**Resistance to Sound Transmission**—Rocklath and plaster used in conjunction with partition assemblies and USG* attachment systems provide substantial resistance to sound transmission. (See Technical Data)

## LIMITATIONS OF USE

1. Not recommended for use as a plaster base for portland cement or lime plasters.

2. ⅜″ Rocklath is designed for supports not to exceed 16″ on centers. For spacings greater than 16″ and not more than 24″, ½″ Rocklath should be used.

3. Where ⅜″ Rocklath is used in conjunction with resilient clips (supported at long edges only) or where ½″ Rocklath is used on supports exceeding 16 inches o.c., three coat plaster application is recommended to eliminate the possibility of sagging during plastering.

4. Where lath and plaster ceilings are located under roof construction, it is recommended that the space thus established be ventilated. Such ventilation, with or without vapor barrier and insulation, shall be designed in accordance with good engineering practice.

5. Rocklath plaster base should not be used where exposed to excessive moisture or humidity.

6. Fire Ratings shown in Technical Data Tables apply only for types, thickness and combinations listed.

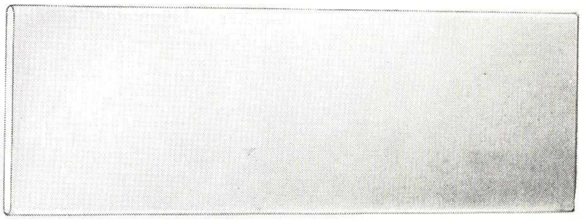
## ROCKLATH PLASTER BASES—TYPES

### PLAIN ROCKLATH

Recommended for nail-on application to wood and nailable steel framing and for clip attachment to wood framing, steel studs and suspended metal grillage.

Size: 16 x 48 inches, ⅜ or ½ inch thick.

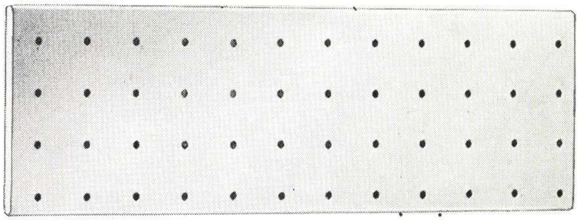
(Also made 16⅕ inches wide for Pacific Coast area)



### PERFORATED ROCKLATH

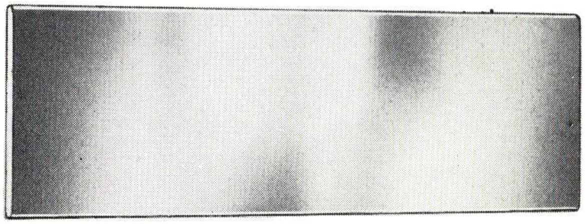
Perforated Rocklath is identical in all respects with plain Rocklath except ¾ inch round holes are punched through the lath 4 inches on center in each direction, one ¾″ diameter hole for each 16 sq. in. of lath area. This provides, in addition to the natural plaster bond, a mechanical key. Higher fire ratings are obtained by the use of perforated Rocklath and gypsum plaster. (See Technical Data Tables, page 13.)

Perforated Rocklath is not recommended for attachment to ceilings, either wood framing or metal grillage, where the only support provided is by clips at edges.



### INSULATING ROCKLATH

Insulating Rocklath provides all the advantages of plain Rocklath as a rigid plaster base, and is manufactured in the same sizes. Bright aluminum foil is laminated to the back of plain Rocklath providing an effective vapor barrier at no additional labor cost.



**"RED TOP," "BRIDJOINT," "PYROBAR," "ROCKLATH," "USG," "TRUSSTEEL," "STRUCTOLITE," are registered trademarks; "BRACE-TITE" is a trademark owned by United States Gypsum and is used by it to distinguish its products. "RED TOP" identifies the particular plasters and finishes; "BRIDJOINT" identifies the particular lathing system; "PYROBAR" identifies the particular gypsum partition tile; "ROCKLATH" identifies the particular gypsum lath or plaster base; "TRUSSTEEL" identifies the particular truss designed stud; "STRUCTOLITE" identifies a particular plaster; "BRACE-TITE" identifies the particular lathing system; all manufactured by United States Gypsum.**

# ROCKLATH PLASTER BASES—CONT.

## INSULATING ROCKLATH—CONT.

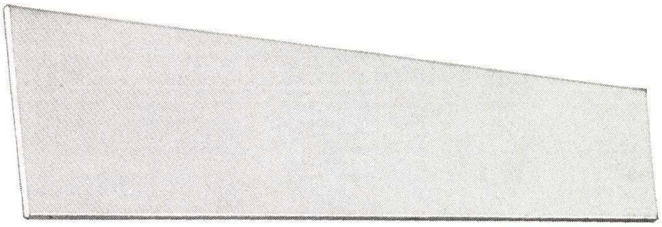
**Insulation**—When properly installed with at least a ¾ inch air space next to the foil, insulating ROCKLATH provides positive insulation having a resistance of 2.59. When used on horizontal surfaces, for retarding the downward flow of heat, its insulating value is about three times greater. (See Thermal Resistance Chart.) Repeated tests and field observations over an extended number of years show that, in normal use, there has been insufficient corrosion of the foil to harm the insulating and vapor barrier characteristics of insulating ROCKLATH. Tests also prove that the effect of dust on insulating ROCKLATH in a vertical position is negligible, and that a greater than normal dust deposit accumulation on insulating ROCKLATH in a horizontal position is required to seriously affect its insulating characteristics.

THERMAL RESISTANCE (R) OF INSULATING ROCKLATH
(½″ OF PLASTER AND FACING AIR SPACE ¾″ OR MORE)
ALL FIGURES BASED ON ASHVE GUIDE

| Direction of Heat Flow | Thickness Insulating ROCKLATH ⅜″ | ½″ |
|---|---|---|
| Downward—Coefficients for ceiling and sloping surfaces—summer conditions. | 6.93 | 7.01 |
| Upward—Coefficients for ceiling and sloping surfaces—winter conditions. | 2.59 | 2.67 |
| Horizontal—These coefficients for walls under summer or winter conditions. | 2.59 | 2.67 |

**Economy**—Costs for application of insulating ROCKLATH plaster base are no more than for plain or perforated ROCKLATH. Material costs average approximately 1½ cents per square foot more than plain or perforated ROCKLATH.

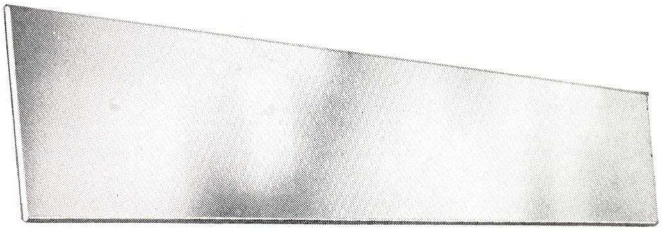
## LONG LENGTH ROCKLATH PLASTER BASE



Long Length ROCKLATH is manufactured ½″ thick, 24″ wide, mill cut to ceiling high lengths as required up to 12 feet, and is formed with longitudinal "V" edges.

It is designed primarily for use as a plaster base in 2″ solid ROCKLATH and plaster partitions. (See 2″ Solid ROCKLATH and Plaster Partition Section for Details.)

## LONG LENGTH INSULATING ROCKLATH



Long Length Insulating ROCKLATH is manufactured ⅜″ thick, 24″ wide with square edges, and mill cut to ceiling high lengths, as required, with bright aluminum foil laminated to the back side.

Designed primarily for furring exterior masonry wall construction. (See Section on USG Exterior Wall Furring System.)

# ROCKLATH ACCESSORIES

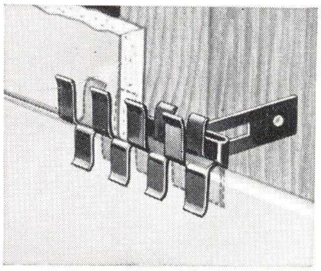
## USG RESILIENT CLIPS

USG Resilient Clips are specially formed to provide a non-rigid or floating attachment of ⅜″ ROCKLATH plaster bases to the structural frame, affording:

1. Increased protection against plaster cracking due to structural movement.
2. Increased sound transmission loss through the resilient attachment.

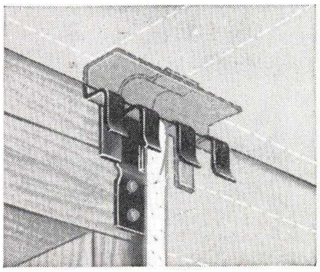
### Resilient Clip R-1

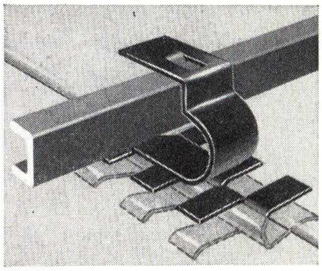
For wood studs or joists spaced 16″ o.c. attached by nailing with 13 gauge, 1⅛″ lathing nail. ROCKLATH is floated ⅜″ free of framing members and held in place by the prongs of the clip.



### Resilient Clip R-2

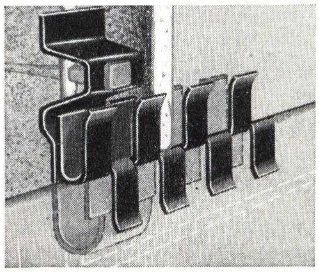
For corners and angles of wood frame construction. Used in conjunction with the R-1 Clips.





### Resilient Clip R-3

For suspended ceilings, resilient attachment of ⅜″ Rocklath to ¾″ cold rolled furring channels. Rocklath is held ½″ away from direct contact with the channel.

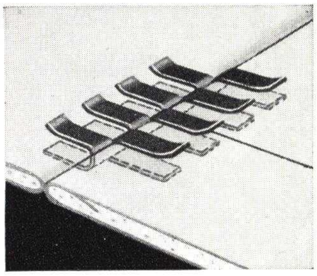


### Resilient Clip R-5

For masonry walls. Nailed in place over Pyrobar, lightweight concrete units or clay tile, using 2″ staple or 10d cut nails driven into the solid sections of the units or by using toggle bolts in hollow sections of the unit. Spaced 16″ o.c. vertically and horizontally. Rocklath is resiliently furred out ⅞″ from the face of the masonry.

## BRIDJOINT* Clips

Specially formed steel clips designed to provide a rigid alignment of gypsum lath where ends of lath do not fall at or on structural members.

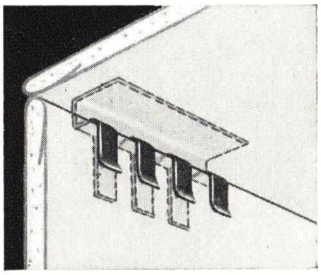


### BRIDJOINT Clip B-1

Field clip for ⅜″ Rocklath to support end joints of lath. Also manufactured for use with ½″ Rocklath.

### BRIDJOINT Clip B-1A

Field clip for ⅜″ Rocklath to support end joints where acoustical tile is to be adhesively applied to the face of the lath. Tile side of clip has flat prongs.

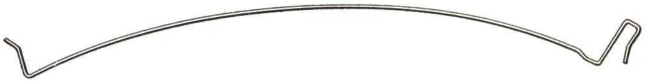


### BRIDJOINT Clip B-2

Used in conjunction with B-1 clips to eliminate nailing in corners and angles. For ⅜″ Rocklath only.

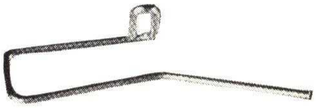
## BRACE-TITE* Clips

Special wire clips for attaching Rocklath plaster base to metal grillages of ¾″ cold rolled channels or Trussteel* Studs when spaced not over 16″ o.c.



### BRACE-TITE Field Clip BT-1

Used for suspended ceilings, exterior wall and beam furring and hollow pipe chase partitions. Designed to provide support across the full width of the lath and has spring action to increase rigidity.



### BRACE-TITE Starter Clip BT-1

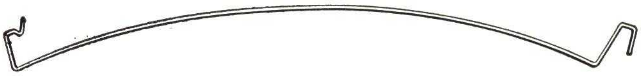
Used in conjunction with BT-1 field clip to start first course of lath.

*T. M. Reg. U. S. Pat. Off.

# ROCKLATH ACCESSORIES—CONT.

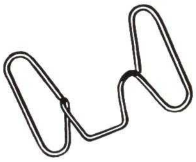
## BRACE-TITE Acoustical Clip BT-A

Used for suspended ceilings with adhesive attachment of acoustical tile. Designed to provide support across the full width of the lath and not interfere with alignment of the tile.



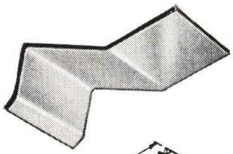
## TRUS-LOK Field Clip TL-1

For attaching Rocklath plaster base to Trussteel Studs.



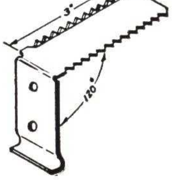
## TRUS-LOK Starter-Finisher Clip TL-2

Used in conjunction with TL-1 clips to start first course of lath.



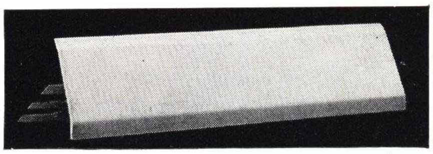
## ADJUSTABLE WALL FURRING BRACKET

Made of 20 gauge galvanized steel with serrated edges for attaching ¾″ furring channels to exterior masonry walls.



## USG 2″ PARTITION TERMINAL

A Partition Terminal for use as a partition cap and plaster ground or to form arched openings in 2″ solid plaster partitions with either metal lath or Rocklath Plaster Base. Cap is formed of 18-gauge steel, welded to 24-gauge punched runner —assembly prime coated. Standard length 8′2″.



## USG "L" SHAPED CEILING RUNNER

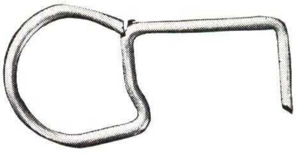
24 gauge black painted, sheet metal angle, for aligning and securing long length Rocklath to ceiling construction.

## CEILING RUNNER CLIPS

Used for attaching ½″ long length Rocklath to "L" shaped ceiling runner.

## USG BRACING CLIP

For attaching ¾″ channels to ½″ long length Rocklath as temporary braces in 2″ solid Rocklath and plaster partition construction.



**USG METAL BASE & CLIPS** (See AIA File No. 20-B).

**USG TRUSSTEEL* STUDS** (See page 7 AIA File No. 20 B).

## CORNER BEAD, CORNERITE, METAL CASINGS, STRIPLATH, ETC.

(See AIA File No. 20-B covering USG Metal Lath and Accessories).

*T. M. Reg. U. S. Pat. Off.

# ROCKLATH RESILIENT LATHING SYSTEM

## DESCRIPTION

Resilient Lathing System is a method for the attachment of ROCKLATH plaster base, floating it free from the basic wall or ceiling framing by means of resilient spring clips.

## FUNCTION AND UTILITY

**Excellent Resistance to Sound Transmission**—Test No. 420, National Bureau of Standards gave a sound transmission loss rating of 52.2 decibels for a wood stud partition with R-1 resilient clips, gypsum lath and sand aggregate plaster both sides.

**Maximum Crack Resistance**—Spring clips permit limited movement of framing members, their resilience reducing the strain on the plaster coat.

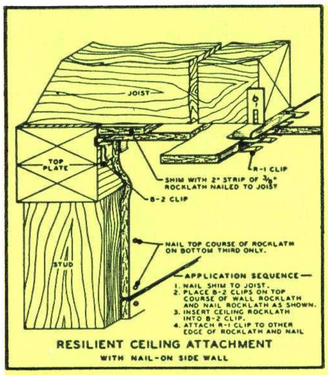
**Fireproof**—Tests at a nationally recognized fire testing laboratory (name on request) gave a one hour fire resistance time to a wood stud partition (load bearing) with perforated ROCKLATH attached with R-1 Resilient Clips each side and plastered to ½″ grounds over the lath with gypsum-perlite 100:2½, 100:2½. When plastered to ½″ grounds over the lath with gypsum-sand 1:2, 1:2, fire resistance period was 58½ minutes.

**Flexible**—May be applied to wood, steel or masonry construction.

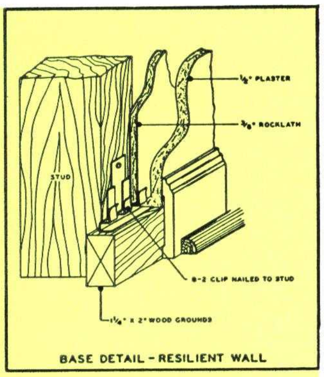
**Cost**—The increase in cost is only nominal and represents principally the additional cost of clips over nail-on system of application.

## LIMITATIONS OF USE

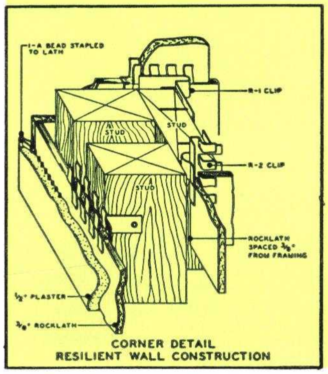
1. The same as for plain ROCKLATH plaster base.
2. Use either plain or perforated ROCKLATH for side wall construction.
3. Perforated ROCKLATH should not be used on ceilings with resilient ROCKLATH clips. Use plain ROCKLATH plaster base with a full scratch coat, raked and *allowed to set*, followed by a brown coat to a total uniform thickness of not less than 7/16″ over the lath.


JOIST
TOP PLATE
STUD
R-1 CLIP
SHIM WITH 2" STRIP OF 3/8" ROCKLATH NAILED TO JOIST
B-2 CLIP
NAIL TOP COURSE OF ROCKLATH ON BOTTOM THIRD ONLY.
—APPLICATION SEQUENCE—
1. NAIL SHIM TO JOIST.
2. PLACE B-2 CLIPS ON TOP COURSE OF WALL ROCKLATH AND NAIL ROCKLATH AS SHOWN.
3. INSERT CEILING ROCKLATH INTO B-2 CLIP.
4. ATTACH R-1 CLIP TO OTHER EDGE OF ROCKLATH AND NAIL

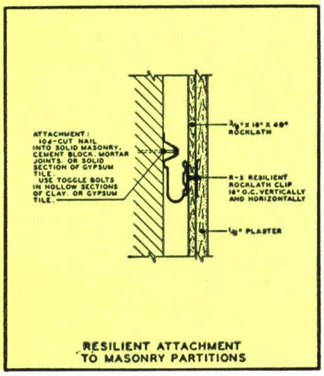
RESILIENT CEILING ATTACHMENT
WITH NAIL-ON SIDE WALL



BASE DETAIL - RESILIENT WALL



CORNER DETAIL
RESILIENT WALL CONSTRUCTION


ATTACHMENT: 10d-CUT NAIL INTO SOLID MASONRY, CEMENT BLOCK, MORTAR JOINTS, OR SOLID SECTION OF GYPSUM TILE. USE TOGGLE BOLTS IN HOLLOW SECTIONS OF CLAY, OR GYPSUM TILE.
3/8" x 16" x 48" ROCKLATH
R-3 RESILIENT ROCKLATH CLIP 16" O.C. VERTICALLY AND HORIZONTALLY
½" PLASTER

RESILIENT ATTACHMENT
TO MASONRY PARTITIONS

# BRIDJOINT LATHING SYSTEM

## DESCRIPTION

The BRIDJOINT Lathing System is a clip application of ROCKLATH plaster base on walls and ceilings so designed that the ends (16″ dimension) of the lath fall between (not on) framing members.

Types B-1 and B-2 clips for 3/8″ ROCKLATH.
B-1 for ½″ ROCKLATH.

## FUNCTION AND UTILITY

**Resistance to Cracking**—Removal of gypsum lath ends from framing members increases resistance to cracking at these vulnerable points.

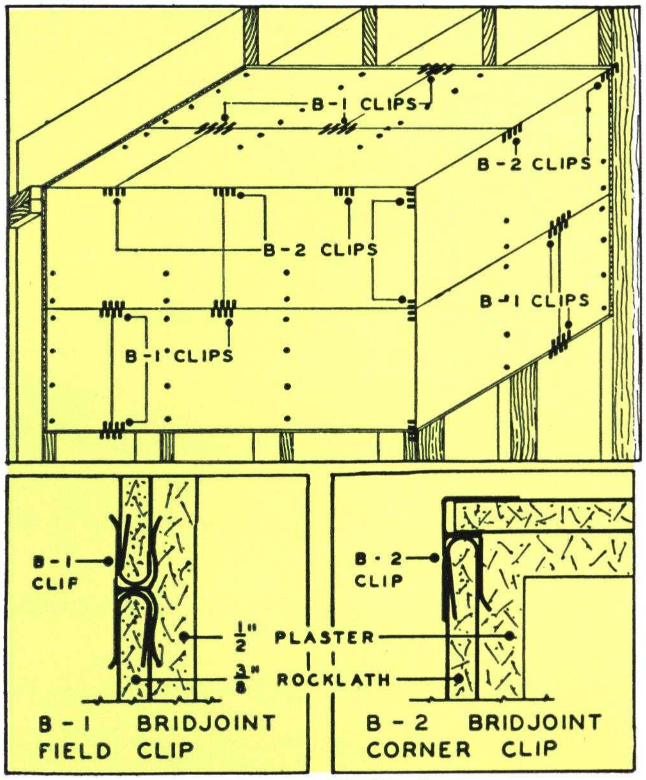
**Framing Members** need not be exactly 16″ on centers, as the ends of the lath may occur at random except at corners.

**Adaptable Over Nailable Steel Framing**—Nails of not less than 3/8″ head shall be used and must be of sufficient length to extend beyond the nail retention curve of the member, or they shall be of special design to lock in member as recommended by manufacturers of the framing.

**Cost**—Twenty-five per cent less nailing of the lath is required. Cornerite and nailing are eliminated in corners, making for speed and economy. This results in only a slight increase over the cost of nail-on construction.

## LIMITATIONS OF USE

Same as for plain ROCKLATH, see page 2.



B-1 BRIDJOINT FIELD CLIP

B-2 BRIDJOINT CORNER CLIP

Details of BRIDJOINT Lathing System

## BRACE-TITE* LATHING SYSTEM

### DESCRIPTION

The Brace-Tite Lathing System is a mechanical suspension of Rocklath plaster base to standard metal grillage (¾″ cold rolled channels not over 16″ o.c.).

### FUNCTION AND UTILITY

**Rigidity Similar To Nail-On.** The field clips, spaced 16 inches o.c., support the Rocklath across the full width of the board. The spring action of the field clip increases rigidity.

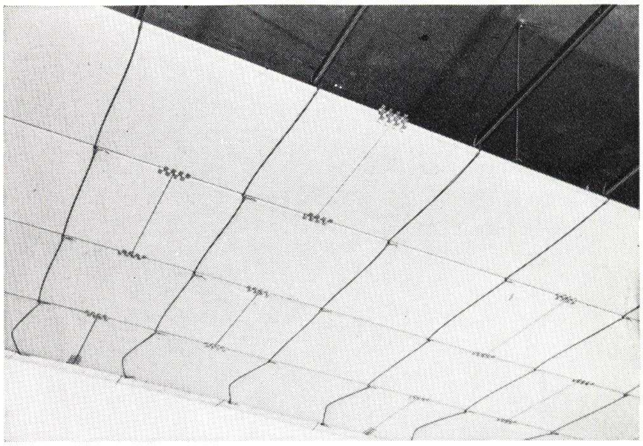
**Fireproof.** Under bar joist construction with 2″ concrete floors above, fire ratings of 1-hour, 2-hours, 3-hours and 4-hours are attainable. (See Technical Date page 14.)

**Easy To Apply.** The loop of the Brace-Tite field clip is dropped over the channel and hooked into the eye of the preceding clip.

**Vapor Permeability.** With Insulating Rocklath, tests at a nationally recognized laboratory gave a vapor permeability of 0.79 perms (See page 13).

**Rapid Erection.** Only three clips are required for each sheet of Rocklath plaster base plus two USG Bridjoint* B-1 clips at the end joint.

**No Special Materials.** Standard ¾″ cold rolled channels may be used on conventional 16-inch or 12-inch spacing. Plain, Perforated or Insulating Rocklath plaster base may be used.



**Acoustical Tile.** A special field clip (BT-A) and Bridjoint 3-1A are available for use where acoustical tile is to be cemented direct to the gypsum lath.

**Reinforces Plaster.** The wire clip embedded in the plaster provides increased strength in the lath and plaster assembly.

**Cost.** As the Brace-Tite system requires only two coat plaster work, its use results in economy of application.

## TRUSSTEEL* STUD ROCKLATH PARTITION

**DESCRIPTION**—A non-load-bearing partition of Trussteel Studs, Rocklath Plaster Base with Trus-Lok Clip attachment, and plaster. Over-all thicknesses: 4½″, 5¼″, 6″, and 8″, depending on stud width.

**FLEXIBLE**—The open web design of the Trussteel Stud allows encasement of small pipes, conduits, heat controls, and small ducts horizontally and vertically without weakening the partition structurally by chasing. Web members are easily cut for larger pipes or ducts.

**VERSATILE**—2½″, 3¼″, 4″, and 6″ Trussteel Studs provide wall thicknesses to meet job requirements.

**STRONG**—Strength of studs is derived from strategic use of metal in a truss design—not from bulk weight. The partition assembly of Trussteel Studs, Rocklath plaster base, and plaster has more than adequate strength for building construction practices and is nationally accepted by building code authorities.

**LIGHTWEIGHT**—This partition assembly weighs approximately 10 lbs. per square foot when plastered with perlite aggregate plaster, and approximately 15 lbs. per square foot with sand aggregate plaster, in any Trussteel Stud width.

**FIRE RESISTANT**—Built of incombustible materials. One hour fire rating is obtained when perforated Rocklath plasterbase is used and plastered with gypsum-sand plaster 1:1, 1:2, or with Structo-lite plaster or gypsum perlite 100:2½.

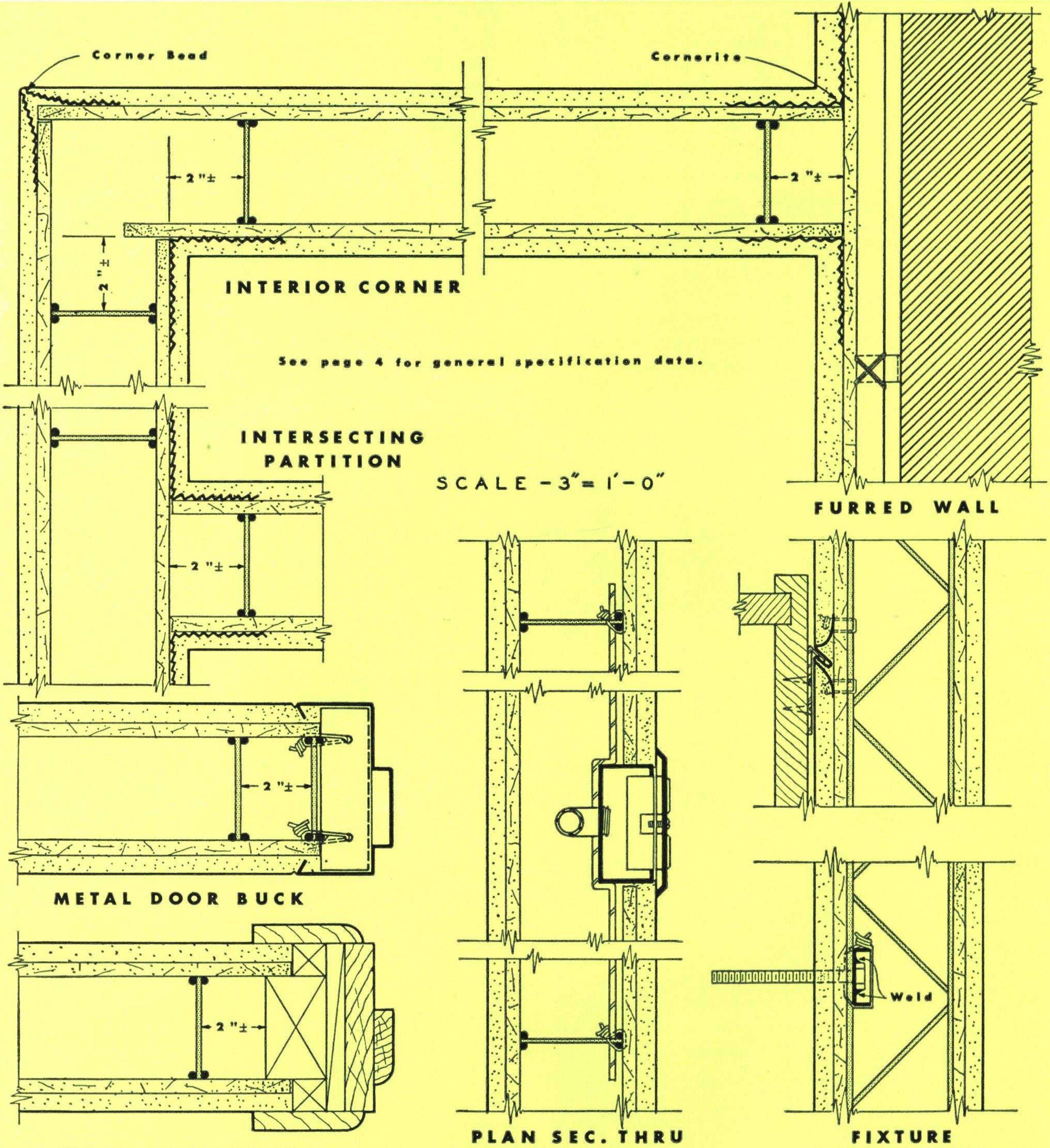
**SOUND REDUCTION**—This partition assembly has good resistance to sound transmission, attaining average sound transmission loss ratings of 48 decibels with sand aggregate plaster, and 44 decibels with perlite aggregate plaster, in tests at a nationally recognized laboratory.

**ECONOMICAL**—Material costs are low, job erection fast—provides installation economies for mechanical trades.

---

*T. M. Reg. U. S. Pat. Off.

## Outlet Box, Fixture Attachments and Door Bucks



INTERIOR CORNER

See page 4 for general specification data.

INTERSECTING PARTITION

SCALE - 3" = 1'-0"

FURRED WALL

METAL DOOR BUCK

WOOD DOOR BUCK

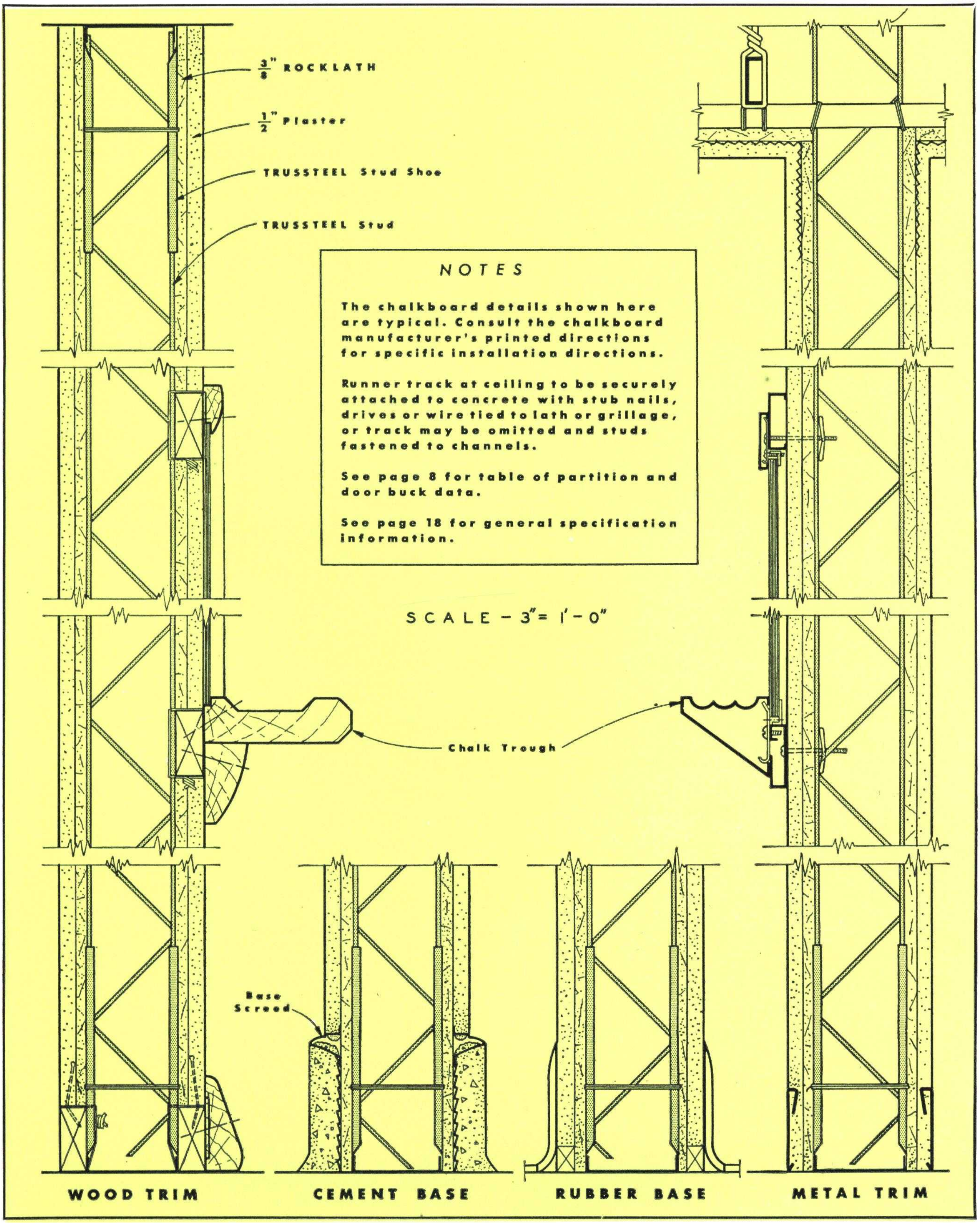
PLAN SEC. THRU OUTLET BOX

FIXTURE ATTACHMENT

| Stud Width | Partition Width | Max. Height | Flush Buck Width | 3/8" Reveal Bucks Width |
|---|---|---|---|---|
| 2 ½ IN. | 4 ½ IN. | 14 FEET | 4 ½ IN. | 5 ¼ IN. |
| 3 ¼ IN. | 5 ¼ IN. | 16 FEET | 5 ¼ IN. | 6 IN. |
| 4 IN. | 6 IN. | 18 FEET | 6 IN. | 6 ¾ IN. |
| 6 IN. | 8 IN. | 20 FEET | 8 IN. | 8 ¾ IN. |

# TRUSSTEEL STUD-ROCKLATH PARTITION—Cont.

## Ceiling Attachment, Chalkboard and Base Details



NOTES

The chalkboard details shown here are typical. Consult the chalkboard manufacturer's printed directions for specific installation directions.

Runner track at ceiling to be securely attached to concrete with stub nails, drives or wire tied to lath or grillage, or track may be omitted and studs fastened to channels.

See page 8 for table of partition and door buck data.

See page 18 for general specification information.

## ROCKLATH AND PLASTER COLUMN FIREPROOFING

### DESCRIPTION

Rocklath plaster base is wired in place against the structural steel column and plastered with gypsum cement plaster and sand or perlite aggregate in proportions and thickness required to give fire rating desired. In four hour ratings, 20 gauge galvanized 1″ hexagonal mesh wire fabric is used in addition to the Rocklath.

### FUNCTION AND UTILITY

**Fireproof**—Gypsum is incombustible and will not communicate high temperatures until completely calcined, a very slow process. Details for column fire ratings of 1, 1½, 2, 3 and 4 hours are given below.

**Light Weight**—Rocklath and plaster fireproofing of structural steel columns weighs from 6 pounds for 1 hour protection to 11 pounds for 4 hour protection per square foot of completed surface area.

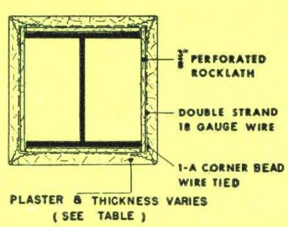
**Low In Cost**—Use of standard lathing and plastering materials, combined with easy attachment of lath and the obvious economy of plastering over gypsum lath, provides low cost column fireproofing.

### LIMITATIONS OF USE

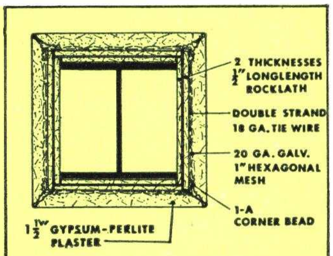
1. Steel corner angles, 2″ x 2″, 4′ high, similar to those required for other column fire protection are required for warehouse or storage space columns.

RATINGS VARY WITH PLASTER THICKNESS AND AGGREGATE RATIO

| RATING | THICKNESS | AGGREGATE | RATIO |
|---|---|---|---|
| 1 HR. | 1/2″ | SAND | 1:2 1/2 |
| 1 1/2 HR. | 5/8″ | SAND | 1:2 1/2 |
| 2 HR. | 1″ | PERLITE | 100:2 1/2 |
| 3 HR. | 1 3/4″ | PERLITE | 100:2<br>100:3 |
| 4 HR. | 1 1/2″ | PERLITE | 100:2<br>100:3 |


⅜″ PERFORATED ROCKLATH
DOUBLE STRAND 18 GAUGE WIRE
1-A CORNER BEAD WIRE TIED
PLASTER & THICKNESS VARIES ( SEE TABLE )

1,1½,2 & 3 HOURS


2 THICKNESSES ½″ LONGLENGTH ROCKLATH
DOUBLE STRAND 18 GA. TIE WIRE
20 GA. GALV. 1″ HEXAGONAL MESH
1-A CORNER BEAD
1½″ GYPSUM-PERLITE PLASTER

4 HOUR

## 2″ SOLID ROCKLATH AND PLASTER PARTITION

### DESCRIPTION

The 2″ Solid Rocklath and Plaster Partition is a studless, non-loadbearing partition consisting of long length Rocklath plaster base, held vertically in floor and ceiling runners, and plastered on both sides.

**Size of ROCKLATH**—½″ thick, 24″ wide by ceiling-high lengths with longitudinal "V" edges.

### FUNCTION AND UTILITY

**Fireproof**—Composed essentially of gypsum, the partition is incombustible and will not transmit temperatures greatly in excess of 212° until completely calcined—a slow process. See Technical Data for one hour fire rating.

**Lightweight**—Only 16 lbs. per sq. ft. of finished partition.

**Space Saving**—Saves 40 to 60 per cent of space occupied by conventional partitions. In every five lineal feet, a 2″ partition creates one extra square foot of usable space over a 4½″ partition.

**Lateral Strength**—The records of an official impact test show that a 60-lb. weight, traveling through a 4-foot fall, failed to produce a discernible crack on a full sized partition after three successive impacts.

**Cost**—Without consideration to space saving, the actual cost is comparable and competitive with conventional wood or metal studs with Rocklath plaster base and plaster, both sides.

Complies with FHA requirements for rental housing.

### LIMITATIONS OF USE

1. For non-bearing partitions only.
2. Limiting height twelve feet.
3. For 1 hour fire rating, Red Top* plaster sanded 1:1, 1:2, Structo-Lite* or gypsum-perlite 100:2, 100:3 must be used.

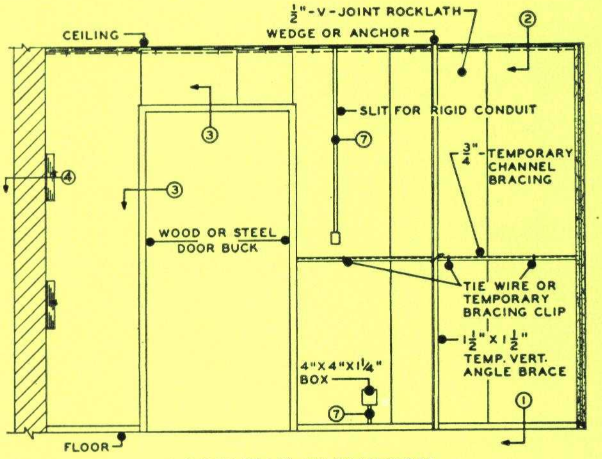
### TECHNICAL DATA

**(All tests made by nationally recognized testing laboratories, except as noted)**

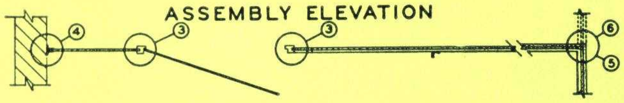
| Construction | Limiting Height | Weight Per Square Foot | Fire Rating | Sound Transmission Loss |
|---|---|---|---|---|
| ½″ Long-length V-edge ROCKLATH plastered both sides with ¾″ RED TOP Plaster, sanded 1:1, 1:2 | 12 Ft. | 16 Lbs. | 1 Hr. | |
| Same, but gypsum-sand 1:2, 1:3 | 12 Ft. | 16 Lbs. | 45 Min. | 37.3 |
| Same, but gypsum-perlite 100:2, 100:3 | 12 Ft. | 9 Lbs. | 1½ Hr. | 36.8 |

**(See page 11 for details)**

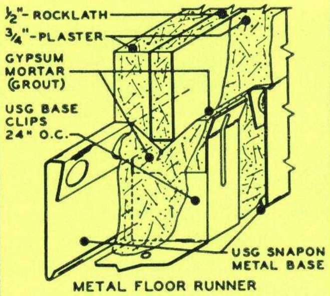
# 2″ SOLID ROCKLATH AND PLASTER PARTITION



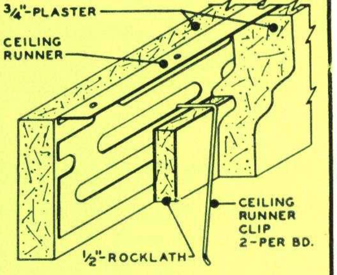
ASSEMBLY ELEVATION



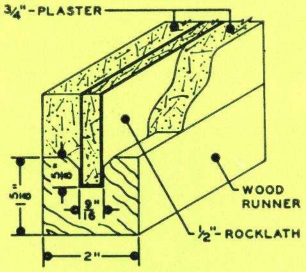
PLAN



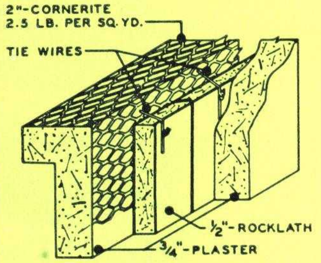
METAL FLOOR RUNNER
DETAIL-1



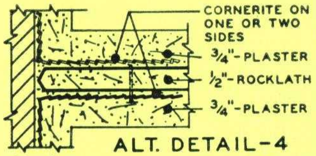
METAL CEILING RUNNER
DETAIL-2



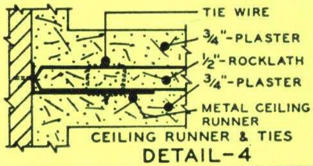
ALTERNATE-WOOD FLOOR RUNNER
DETAIL-1



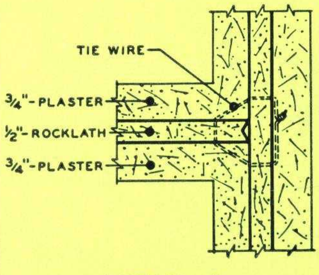
ALTERNATE
CEILING RUNNER-SINGLE CORNERITE
DETAIL-2



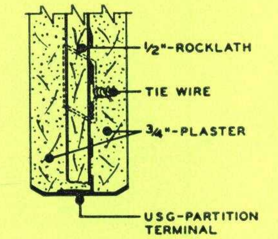
ALT. DETAIL-4



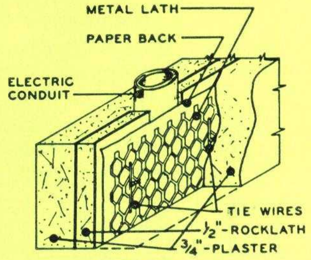
CEILING RUNNER & TIES
DETAIL-4



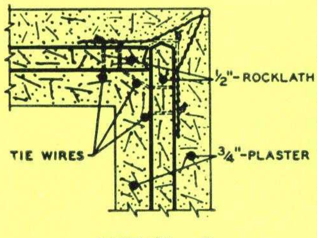
DETAIL-6



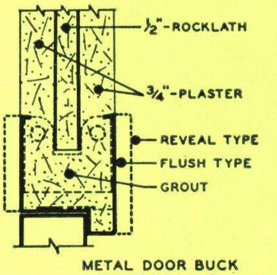
DETAIL
METAL PARTITION END



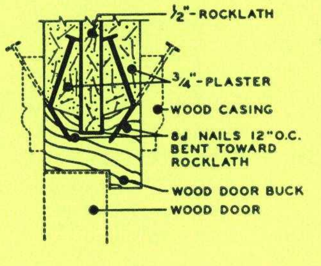
RIGID CONDUIT
DETAIL-7



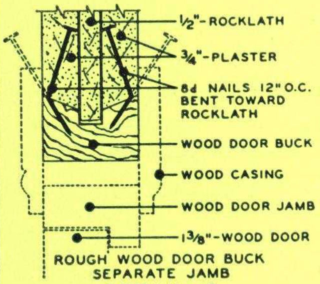
DETAIL-5



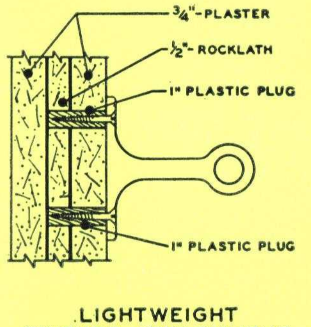
METAL DOOR BUCK
DETAIL-3



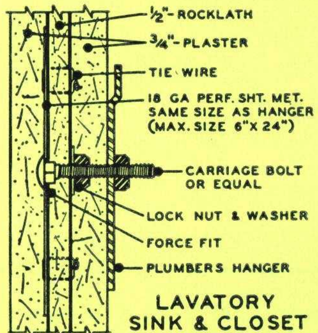
INTEGRAL WOOD DOOR BUCK
DETAIL-3



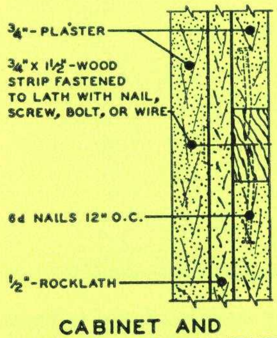
ROUGH WOOD DOOR BUCK
SEPARATE JAMB
DETAIL-3



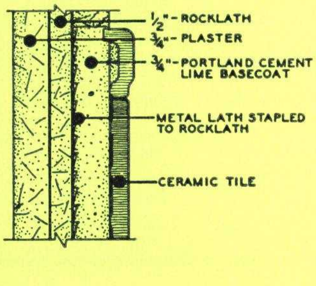
LIGHTWEIGHT
FIXTURE ATTACHMENT



LAVATORY
SINK & CLOSET
ATTACHMENT


¾"-PLASTER
¾"x1½"-WOOD STRIP FASTENED TO LATH WITH NAIL, SCREW, BOLT, OR WIRE
6d NAILS 12" O.C.
½"-ROCKLATH

CABINET AND
SHELVING ATTACHMENT


½"-ROCKLATH
¾"-PLASTER
⅜"-PORTLAND CEMENT LIME BASECOAT
METAL LATH STAPLED TO ROCKLATH
CERAMIC TILE

CERAMIC
TILE ATTACHMENT

# EXTERIOR WALL FURRING SYSTEM

## DESCRIPTION

The Exterior Wall Furring System is a method of attaching ¾″ channels and long length Insulating ROCKLATH plaster base to exterior walls using USG Adjustable Wall Furring Brackets.

## FUNCTION AND UTILITY

**Furrs and Aligns Exterior Wall**—Attachment of ¾″ channels and Long Length Insulating ROCKLATH to exterior masonry walls using USG Adjustable Wall Furring Brackets furrs and aligns wall, providing proper air space and a uniformly even plaster base.

**Sturdy—Rust Resistant—Easily Attached**—USG Adjustable Wall Furring Brackets are made from 20 gauge tight coat galvanized steel. Easily attached to masonry walls using ⅝″ stub nails for concrete and 2″ cut nails for masonry, or can be laid in mortar joints.

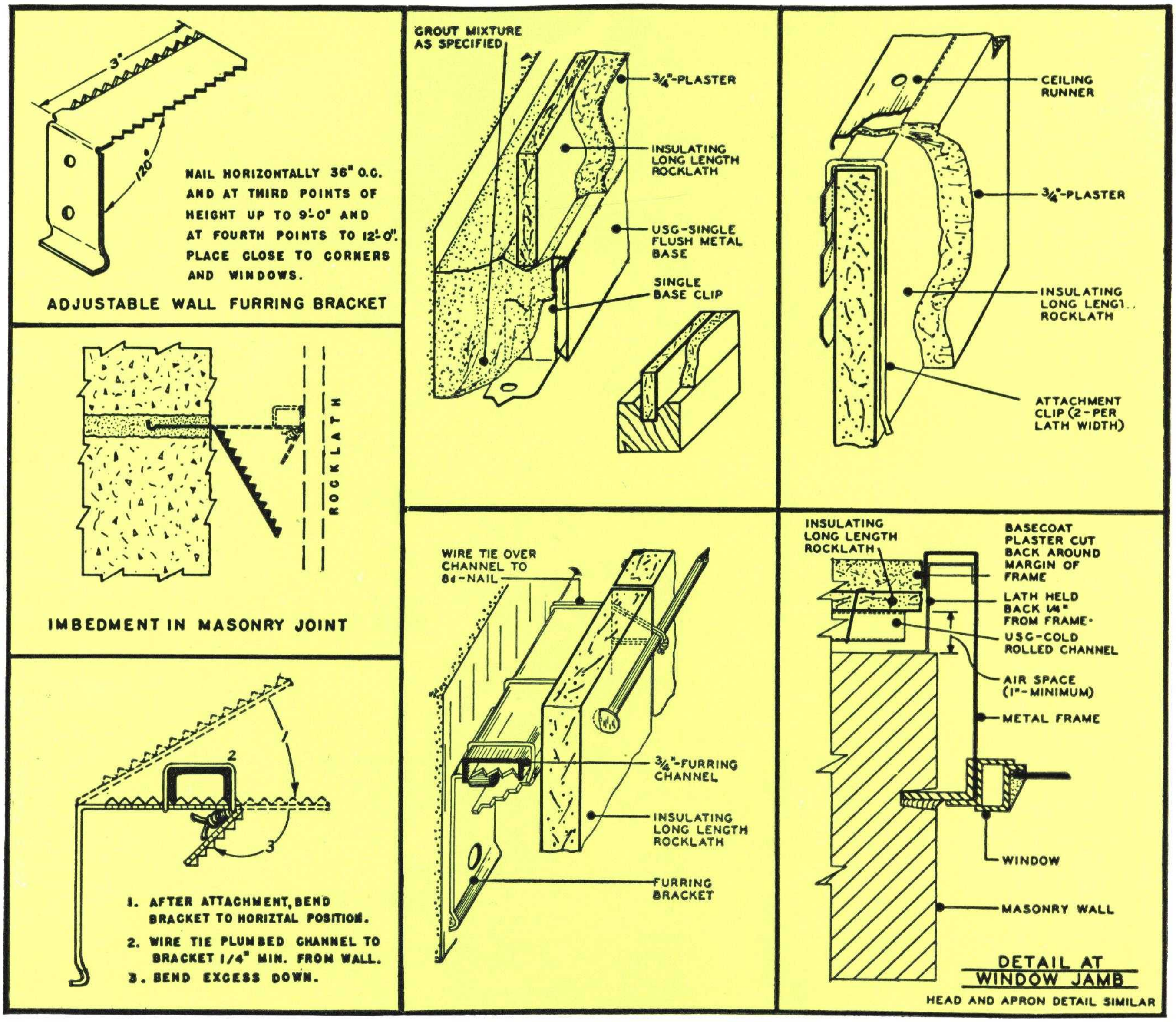
**Insulation**—The use of long length Insulating ROCKLATH provides insulation equivalent to ½″ fiber insulating board. (See Insulating ROCKLATH plaster base, pages 2 and 3.)

**Vapor Barrier**—Insulating ROCKLATH plaster base is an effective safeguard against harmful condensation.

## LIMITATIONS

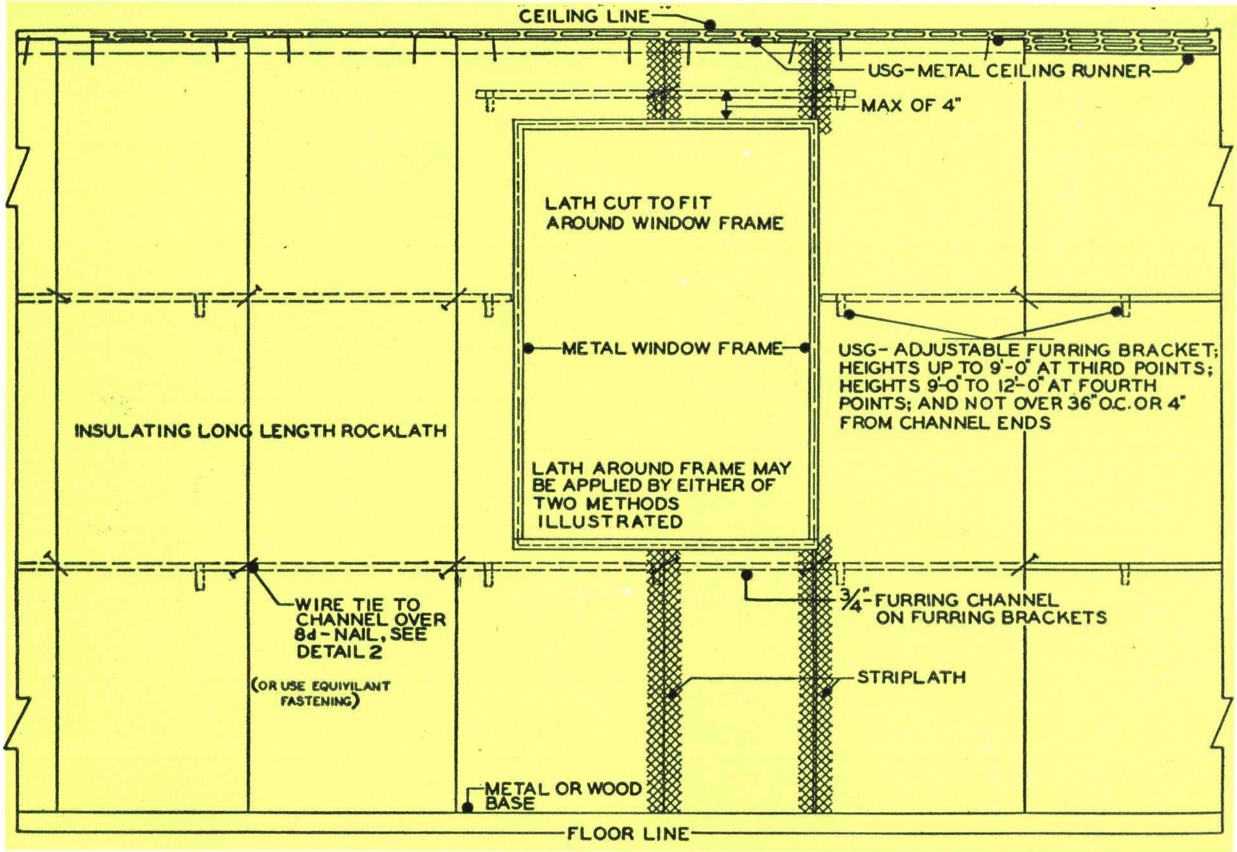
1. Limiting height is 12′0″ unless special details are incorporated.

2. Minimum air space of 1″ required. Space between back of lath and the wall shall not be filled with wool or other materials.


3″
120°
NAIL HORIZONTALLY 36″ O.C. AND AT THIRD POINTS OF HEIGHT UP TO 9′-0″ AND AT FOURTH POINTS TO 12′-0″. PLACE CLOSE TO CORNERS AND WINDOWS.
ADJUSTABLE WALL FURRING BRACKET
ROCKLATH
IMBEDMENT IN MASONRY JOINT
1
2
3
1. AFTER ATTACHMENT, BEND BRACKET TO HORIZTAL POSITION.
2. WIRE TIE PLUMBED CHANNEL TO BRACKET 1/4″ MIN. FROM WALL.
3. BEND EXCESS DOWN.
GROUT MIXTURE AS SPECIFIED
¾″-PLASTER
INSULATING LONG LENGTH ROCKLATH
USG-SINGLE FLUSH METAL BASE
SINGLE BASE CLIP
CEILING RUNNER
¾″-PLASTER
INSULATING LONG LENGTH ROCKLATH
ATTACHMENT CLIP (2-PER LATH WIDTH)
WIRE TIE OVER CHANNEL TO 8d-NAIL
¾″-FURRING CHANNEL
INSULATING LONG LENGTH ROCKLATH
FURRING BRACKET
INSULATING LONG LENGTH ROCKLATH
BASECOAT PLASTER CUT BACK AROUND MARGIN OF FRAME
LATH HELD BACK ¼″ FROM FRAME
USG-COLD ROLLED CHANNEL
AIR SPACE (1″-MINIMUM)
METAL FRAME
WINDOW
MASONRY WALL
DETAIL AT WINDOW JAMB
HEAD AND APRON DETAIL SIMILAR

**(For details of use with long length Rocklath see page 13)**

## EXTERIOR WALL FURRING SYSTEM (Using Long Length Insulating ROCKLATH)


CEILING LINE
USG-METAL CEILING RUNNER
MAX OF 4"
LATH CUT TO FIT AROUND WINDOW FRAME
METAL WINDOW FRAME
USG-ADJUSTABLE FURRING BRACKET; HEIGHTS UP TO 9'-0" AT THIRD POINTS; HEIGHTS 9'-0" TO 12'-0" AT FOURTH POINTS; AND NOT OVER 36" O.C. OR 4" FROM CHANNEL ENDS
INSULATING LONG LENGTH ROCKLATH
LATH AROUND FRAME MAY BE APPLIED BY EITHER OF TWO METHODS ILLUSTRATED
WIRE TIE TO CHANNEL OVER 8d-NAIL, SEE DETAIL 2
(OR USE EQUIVILANT FASTENING)
3/4"-FURRING CHANNEL ON FURRING BRACKETS
STRIPLATH
METAL OR WOOD BASE
FLOOR LINE

## VAPOR BARRIERS

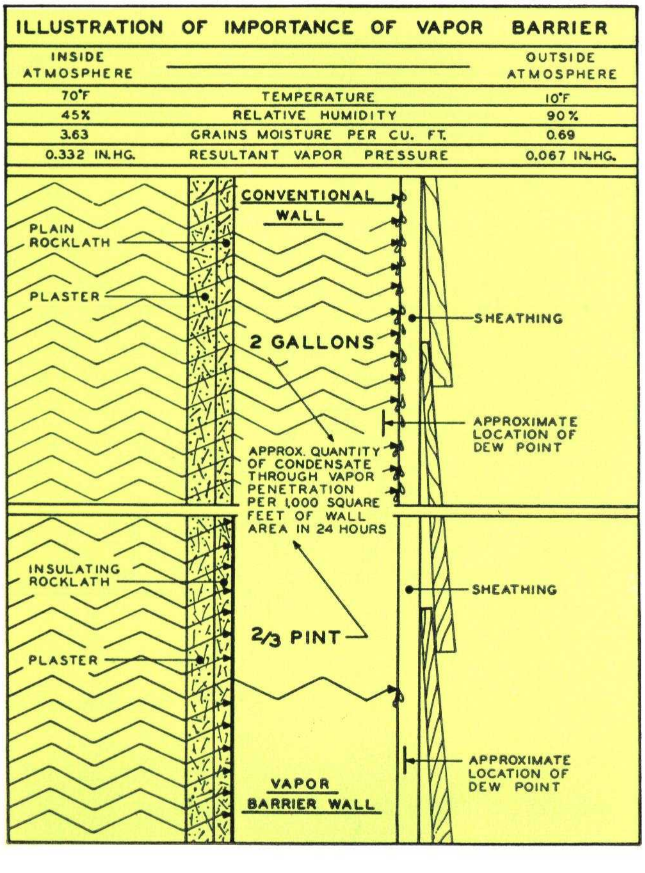


ILLUSTRATION OF IMPORTANCE OF VAPOR BARRIER

| INSIDE ATMOSPHERE | | OUTSIDE ATMOSPHERE |
|---|---|---|
| 70°F | TEMPERATURE | 10°F |
| 45% | RELATIVE HUMIDITY | 90% |
| 3.63 | GRAINS MOISTURE PER CU. FT. | 0.69 |
| 0.332 IN.HG. | RESULTANT VAPOR PRESSURE | 0.067 IN.HG. |

CONVENTIONAL WALL
PLAIN ROCKLATH
PLASTER
SHEATHING
2 GALLONS
APPROXIMATE LOCATION OF DEW POINT
APPROX. QUANTITY OF CONDENSATE THROUGH VAPOR PENETRATION PER 1,000 SQUARE FEET OF WALL AREA IN 24 HOURS
INSULATING ROCKLATH
SHEATHING
2/3 PINT
PLASTER
APPROXIMATE LOCATION OF DEW POINT
VAPOR BARRIER WALL

**Vapor Barrier**—The insulating Rocklath applied to the inside face of all exterior walls and top floor ceilings provides an effective vapor barrier to help safeguard against harmful condensation within such spaces. Since aluminum foil is one of the best vapor barriers known and used commercially F.H.A. allows (at the discretion of local offices) the use of insulating Rocklath with blowing wool in frame walls, ceilings or roofs the aluminum foil providing the vapor barrier.

When the atmospheric conditions indicated in the accompanying chart are of considerable duration, the amount of condensation in the "Conventional Wall" is sufficient to damage the interior decoration, exterior paint, or any of the other wall components. In the "Vapor Barrier Wall," however, the quantity of condensate is so minor as to be readily dissipated.

## RECOMMENDATIONS

1. An efficient vapor barrier should be installed in all exterior walls and ceilings in locations where below freezing weather occurs for extended periods of time.

2. Vapor barrier should be located on the warm side of the exterior wall or top floor ceiling.

3. Vapor barrier should have a vapor permeability of not more than 1.00 perms. (Grains per square foot per hour per inch of mercury vapor pressure difference.)

## TECHNICAL DATA

Tests at a nationally recognized testing laboratory gave an average permeability for Insulating Rocklath and ½ inch gypsum plaster applied to wood studs in the normal manner of 0.67 perms.

# ROCKLATH PLASTER BASES

## TECHNICAL DATA

**All Tests Made by Nationally Recognized Laboratories, Unless Otherwise Noted**

### PARTITIONS

| Construction | Approx. Weight Lbs. per Sq. Ft. Lath and Plaster Only | Plaster & Aggregate | Thickness | Fire Rating | Sound Transmission Loss |
|---|---|---|---|---|---|
| ⅜″ Plain ROCKLATH, nail-on 2″x4″ studs. | 12.0 | Gypsum-Sand 1:2—1:2 | ½″ | 45 min. | 41.1 |
| ⅜″ Plain ROCKLATH nail-on, 2″x4″ studs. | 11.0 | Wood fiber plaster. | ½″ | 1 hr. | 41.1 |
| ⅜″ Perforated ROCKLATH nail-on, 2″x4″ studs. | 12.0 | Gypsum-Sand 1:2—1:2 | ½″ | 1 hr. | 41.1 |
| ⅜″ Perforated ROCKLATH nail-on, 2″x4″ studs. | 8.0 | Gypsum-Perlite 100:2½ | ½″ | 1 hr. | |
| ⅜″ Perforated ROCKLATH nail-on, 2″x4″ studs. | 8.0 | Gypsum-Vermiculite 100:2½ | ½″ | 1 hr. | |
| ⅜″ Perforated ROCKLATH attached by BRACE-TITE system to TRUSSTEEL Studs. | 8.0<br>12.0 | STRUCTO-LITE<br>Gypsum-Sand 1:2 | ½″<br>½″ | 1 hr.<br>1 hr. | 46.5 |
| ⅜″ Perforated ROCKLATH attached by TRUS-LOK Clips to TRUSSTEEL Studs | 8.0 | Gypsum-Perlite 100:2½ | ½″ | 1 hr. | 48.0 |

### FLOORS AND CEILINGS

| Construction | Approx. Weight Lbs. per Sq. Ft. Lath and Plaster Only | Plaster & Aggregate | Thickness | Fire Rating | Sound Transmission Loss |
|---|---|---|---|---|---|
| ⅜″ Perforated ROCKLATH nailed to 2″x10″ wood joists with ⅜″ headed nails. ¾″ sub floor —resin sized building paper— T&G finished floor. | 6.0 | Gypsum-Sand 1:2—1:2 | ½″ | 30 min. | |
| ⅜″ Perforated ROCKLATH nailed to 2″x10″ wood joists with ⅜″ headed nails (5 per lath per joist). Striplath applied to joists with ¾″ nails having ½″ head. | 6.0 | Gypsum-Sand 1:2—1:2 | ½″ | 1 hr. | |
| ⅜″ Perforated ROCKLATH nailed to 2″x10″ wood joists with 19/64″ head nails —4 per lath per joist. | 4.0 | Gypsum-Perlite 100:2½ | ½″ | 1 hr. | |
| | | Gypsum-Vermiculite 100-2½ | ½″ | 1 hr. | |
| ⅜″ Plain ROCKLATH nailed to 2″x10″ wood joists with 19/64″ head nails—4 per lath per joist—20 ga. 1″ hex. wire mesh nailed to joists through lath. | 4.0 | Gypsum-Perlite 100:2½ | ½″ | 1½ hr. | |
| ⅜″ Perforated ROCKLATH attached by BRACE-TITE system under steel joists. 2″ concrete slab. Channels 16″ o.c. | 4.5 | STRUCTO-LITE or gypsum perlite 100:2½ | ⅝″ | 1 hr. | |
| Same as above but with supplementary 14 Ga. diagonal wires. | 4.0 | STRUCTO-LITE or gypsum perlite 100:2½ | ½″ | 2 hr. | |
| Same as above but with channels 12″ o.c. and supplementary 14 Ga. diagonal wires. | 4.5 | STRUCTO-LITE or gypsum perlite 100:2½ | ⅝″ | 3 hr. | |

# GYPSUM LATHING SPECIFICATIONS

**Notes to Architect:** *Following are complete specifications for* Rocklath *plaster bases, including nail-on and clip attachment, and partition systems. Select paragraphs required to complete particular job specifications, taking into account the type of lath, type of plaster and minimum plaster thickness required by certain systems and fire ratings:*

**Where lath and plaster ceilings are located under roof construction, it is recommended that the space thus established be ventilated. Such ventilation, with or without vapor barrier and insulation, shall be designed in accordance with accepted engineering practice.**

*Where reinforced concrete or concrete fireproofed structural steel construction is used, it is recommended that relief from stresses imposed by such members be provided by locating the partitions so that the face of the plaster does not continue in the same plane across the face of such columns or beams. If partitions are not so located, one of the methods given below should be used to provide partial isolation from the faces of the structural members, in the following order of preference:*

*1. Furring away from the face of such members.*

*2. By allowing the* Rocklath *to carry across the faces of such structural members.*

*3. By scatter nailing No. 30 asphalt felt then 2.5 lb. diamond mesh metal lath across the faces of such structural members, carrying felt and metal lath out at least 1″ onto the* Rocklath *and stapling to the* Rocklath.

## I. SCOPE

Unless otherwise indicated, all walls, partitions and ceilings are included.

## II. GENERAL CONDITIONS

In cold weather, building should be glazed and heated before lathing.

## III. MATERIALS

**A. Gypsum Lath**—Shall be Rocklath Plaster Base manufactured by United States Gypsum Company in the following types and sizes as required:

1. (Plain) (Perforated) (Insulating Rocklath) (⅜″) (½″) thick by 16″ x 48″.

2. Long length Rocklath ½″ thick, 24″ wide and ceiling high lengths, with "V" edges.

3. Long length insulating Rocklath ⅜″ thick, 24″ wide, and ceiling high lengths, with square edges.

**B. Cornerite**—Shall be USG Cornerite.

**C. Corner Bead**—Shall be USG
(1A Expanded Flange)
(4A Flexible Solid Flange Corner Bead)
(For ¾″ Bull Nose Bead specify either 10A Expanded Flange or 5A Short Flange)

**D. Channels** shall be USG ¾″ and 1½″ Cold Rolled Painted Channels.

**E. Striplath** shall be 3″ wide USG Striplath.

**F. Resilient Clips**—Shall be USG
(R-1—Resilient Clips for wood stud or joist framing)
(R-2—Resilient Clips for corners and angles, wood frame construction)
(R-3—Resilient Clips of ¾″ channels, ceilings only)
(R-5—Resilient Clips for masonry construction)

**G. BRIDJOINT Clips**—Shall be USG
(B-1—Field Clips for (⅜″) (½″) Rocklath plaster base)
(B-1A—Field Clips for (⅜″) (½″) plaster base)
(B-2—Corner Clip for ⅜″ Rocklath only)

**H. BRACE-TITE Clips**—Shall be USG Brace-Tite Clips
(BT-1—For ¾″ Channels)
(BT-A—For Acoustical base)

Trus-Lok TL-1 field clips and TL-2 starter finisher clips manufactured by United States Gypsum Co.

**I. TRUS-LOK Clips**—Shall be USG Trus-Lok TL-1 field clips and TL-2 starter-finisher clips manufactured by United States Gypsum Company.

**J. Ceiling Runner**—For 2″ lath and plaster partitions shall be USG L-shaped Ceiling Runner and ceiling runner clips for attaching long length Rocklath to ceiling construction.

**K. Furring Brackets**—Shall be USG Adjustable Wall Furring Brackets.

**L. Bracing Clips**—Shall be USG bracing clips for temporary bracing of solid Rocklath and plaster partitions.

**M. Metal Studs**—Shall be (2½″) (3¼″) (4″) (6″) Trussteel Studs, Runner Track and attachment shoes.

**N. Metal Base**—Shall be USG 2½″ high flush metal base with double, single, masonry and stud clips as required.

**O. Lath Nails**—Shall be 1⅛″ (1¼″ for ½″ Rocklath), 13 gauge, blued, 19/64″ flat head, smooth diamond point nails.

**P. Staples**—For attachment of Cornerite, Corner Bead and Striplath shall be gummed finish steel having 9/16″ legs and designed for mechanical driving.

**Q. Hangers**—Shall be 8 gauge galvanized annealed wire.

**R. Tie Wire**—Shall be 16 gauge and 18 gauge galvanized annealed wire as hereafter specified.

**S. Tie-In Shoes**—Shall be 12″ lengths of Cornerite or L-type ceiling runner.

## IV. GROUNDS

Shall be set to provide the following minimum plaster thickness including finish over the Rocklath plaster base:

a) ½″ on wood frame or metal stud.

b) ¾″ each face on 2″ Rocklath and plaster partition system.

c) (½″) (⅝″) (1″) on Brace-Tite lathing system.

d) ¾″ on long length Rocklath exterior wall furring system.

e) (½″) (⅝″) (1″) (1¾″) for Rocklath column fireproofing.

## V. ERECTION

### A. Nail-On to Wood Framing Member:

Rocklath plaster base shall be applied face out with the long dimension at right angles to the framing members. The end joints shall be staggered to fall on different supports in adjacent courses, or the Rocklath shall be erected so that the end joints are continuous on a support. In the latter case the continuous joints shall be covered with 3-inch strip-lath and the long or edge joints shall be offset or staggered. In all cases, Rocklath joints shall be butted together. Space nails approximately ⅜″ from edges and approximately 5″ apart, using four nails per lath per support. (For ½″ Rocklath with supports more than 16″ o.c. nails must be spaced approximately 4″ apart using 5 nails per lath per support.) Cut accurately and fit Rocklath plaster base neatly around all electrical outlets, etc. All internal angles shall be reinforced with cornerite over the Rocklath and all exterior angles shall be reinforced with corner bead secured to the Rocklath by stapling.

All openings in walls or ceilings over 2 square feet in area shall have 3-inch strip lath applied to the lath diagonally at all corners of the opening.

### B. BRIDJOINT Lathing System

**1. For Wood Framing**—Rocklath shall be nailed to the framing members in such a manner that the end joints of the lath (16″ dimension) do not fall on framing members and are staggered in adjacent courses. End joints shall be secured to adjacent lath by use of a B-1 Bridjoint Field Clip at each corner of each lath. The internal corners of lath may be secured to each other by the use of B-2 Bridjoint corner clips. In lieu of B-2 clips, Cornerite may be stapled to the Rocklath. Corner Bead shall be applied to all exterior angles by stapling to Rocklath plaster base. Do not nail Rocklath to framing members in the angles.

**2. For Nailable Steel Framing**—Rocklath shall be nailed to the framing members, using a nail with a ⅜″ head and of sufficient length to provide proper "lock" in the nail retention curve or as recommended by the manufacturer of the framing member, in such a manner that the end joints of the lath (16″ dimension) do not fall on the framing members. End joints shall be staggered in adjacent courses and shall be secured to adjacent lath by use of B-1 clips at each lath corner. Nail Rocklath to framing members in the angles. Cornerite shall be applied to interior angles and corner bead to exterior angles by stapling to the Rocklath.

### C. Resilient Lathing System

Rocklath plaster base shall be applied face out with the long dimension at right angles to the framing members and with end joints staggered and over framing members. Rocklath shall be attached to the framing members by means of R-1 Resilient Clips nailed to framing and placed at every intersection of Rocklath edges with framing members, and at corners with R-2 Resilient Clips so that the Rocklath is secured by the clips spaced 16″ o.c. in both directions. Corner Beads shall be stapled to Rocklath. Under no circumstances shall Rocklath plaster base be attached directly to the framing.

For resilient ceiling attachment with nail-on side wall, shim the perimeter of the ceiling with a 2″ strip of ⅜″ Rocklath nailed to joists, place a B-2 Bridjoint Corner Clip on top course of wall Rocklath and nail bottom third of this course only. Insert ceiling Rocklath into B-2 clip at the angle, attach resilient clips to other edge and proceed with resilient application on ceiling.

### D. Resilient Lathing System for Masonry

R-5 Resilient Clips shall be used for the attachment of Rocklath to masonry walls by placing the clips not over 16″ o.c. along the long edge of the lath. Rocklath shall be erected with long dimension horizontal, with end joints staggered in adjacent courses. End joints of lath shall be secured to the adjacent lath by use of an R-5 Resilient Clip at each corner of the lath.

Each clip shall be anchored to the masonry wall by nailing with 10d cut nails driven into the mortar joints or into the solid sections of concrete block and gypsum tile or by toggle bolting into hollow sections of such units.

### E. Grillage for Suspended Ceilings (BRACE-TITE)

Hangers shall be placed not over 3′0″ o.c. along main runner direction and not over 4′0″ o.c. in opposite direction and 6″ from boundary walls or beams. They shall be of sufficient length to provide proper anchorage to main runners. 1½″ cold rolled main runners shall be installed not over 4′0″ o.c., properly leveled at designated height and hangers secured to runners not over 3′0″. Channel ends shall be spliced not less than 12″ with a double strand of tie wire near each end of splice. ¾″ cold rolled channel cross furring shall be saddle tied to runner channel (12″) (16″) o.c. and 2″ from parallel walls, beams and troffers, with double strand of 16 gauge tie wire. Channel ends shall be lapped 8″ and tied near each end of splice with double strand of tie wire. The channel ends must extend to the plane of the abutting side wall and top flange of channel end bent up to prevent clips from sliding off.

### F. Grillage for Furred Ceilings (BRACE-TITE)

¾″ cold rolled channels shall be saddle tied to steel joists (12″) (16″) o.c. and 2″ from parallel walls, beams or troffers with double strand of 16 gauge tie wire. Channel ends shall be lapped 8″ and tied near each end of splice. The channel ends must extend to the plane of the abutting side wall and top flange of channel end bent up.

### G. BRACE-TITE Lathing System for Plaster

Place a Brace-Tite starter clip over the end of the ¾″ channel at the point where it meets the starting wall. Rocklath Plaster Base shall be applied with the long dimension at right angles to the ¾″ channels. Rocklath shall rest on top of the starter clip loops, and shall be fastened to each channel with a Brace-Tite field clip. Rocklath end joints shall fall between channels and shall be secured with USG B-1 Bridjoint field clips on both sides. Succeeding courses of Rocklath Plaster Base shall be attached with Brace-Tite field clips hooked over the channel and fastened into the eyes of the preceding clips. End joints of Rocklath, in adjacent courses, shall be staggered. The last course of Rocklath shall be cut to the width required to fill the remaining space. The Brace-Tite field clip used for this final course shall be inserted through the eye of preceding clip, pulled tight into eye and excess length cut off.

Where ¾″ channel runs are interrupted by light troffers, grilles, etc., Brace-Tite starter clips shall be used to start a new course of Rocklath. For these locations, the extended leg of the starter clip shall be cut off so as not to protrude below the brown coat of plaster.

Angles between the ceiling and all vertical plastered planes shall be reinforced with USG Cornerite stapled to the Rocklath.

(For 2 or 3 hour fire rating) Lengths of 14 gauge wires shall be run diagonally across ceiling through the Brace-Tite clip loops. (For 4 hour rating Staple 20 gauge hexagonal mesh to lath and wire tie mesh to furring channels at long edge of lath.

**H. BRACE-TITE Lathing System for Adhesive Application of Acoustical Tile.** Place the full loop end of a Brace-Tite Acoustical Clip over the end of each of the ¾″ channels at the point where it meets the starting wall. Rocklath Plaster Base shall be applied with the long dimension at right angles to the ¾″ channels. Rocklath shall rest on top of the Brace-Tite Acoustical Clip and the half loop end snapped over the ¾″ channel to secure the lath tight against the channel.

Rocklath end joints shall fall between channels and shall be secured with B-1A Bridjoint Clips to adjacent lath on both sides, flat side of clip on tile side. Succeeding courses of Rocklath Plaster Base shall be attached with Brace-Tite Acoustical Clips hooked over the channel behind the loop of the previous BT-A Clip and carried across the Rocklath face snapping the half loop end over the channel. End joints of the Rocklath shall be staggered in adjacent courses.

The last course of Rocklath shall be cut to the width required to fill the remaining space. The Brace-Tite Acoustical Clip shall be hooked over the ¾″ channel where it meets the end wall, cut off approximately 2″ longer than the piece of Rocklath it is supporting, and wire tied to the ¾″ channel with loop of 18 gauge tie wire. The last course of Rocklath may be applied either at the end wall or in the field of the ceiling.

Where ¾″ channel runs are interrupted by light troffers, grilles, etc., the Rocklath shall be cut as required and the clip bent over the channel and excess length cut off or the ROCKLATH installed in a similar manner as specified for application of the last course of ROCKLATH plaster base.

### I. Resilient Lathing System for Suspended Ceilings

R-3 Resilient Clips shall be used for the attachment of ROCKLATH to ¾″ cold rolled ceiling channels spaced 16″ o.c. by placing the lath at right angles to the channels, hooking the clips over the top flange of the channel and inserting the lath edge into the prongs of the clip. End joints shall fall under the channels and shall be staggered in alternate courses.

### J. TRUSSTEEL Stud ROCKLATH Partition

Runner tracks shall be aligned accurately according to partition layout and secured to concrete slabs with ½″ concrete stub nails not more than 24″ on center, or wire-tied to suspended ceilings not more than 16″ on center. Where TL-2 Starter-Finisher Clips are to be used at ceiling angles, runner track must be secured to concrete slab with firm attachment equivalent to power driven anchors spaced not more than 24″ on center. Use runner track at top of door bucks and over and under borrowed lights.

Studs shall be placed vertically in the runner track not over 16″ on center and each stud shall be secured to runner track with two attachment shoes both at top and bottom. Each pair of attachment shoes shall be wire-tied around stud with double strand of 18-gauge galvanized tie wire.

Studs shall be located approximately 2″ from all door buck jambs, abutting partitions, or other construction. With steel bucks, an additional anchorage stud is required at each jamb. All corners shall be framed with a stud approximately 2″ from each side of the internal angle. Securely wire-tie studs adjacent to door bucks to the jamb anchors.

Start lath application at the bottom with long dimensions of ROCKLATH at right angles to the stud. The Starter course of lath should be secured to the studs by TL-1 Field Clips hooked around the stud and over the top of the lath, and with TL-2 Starter-Finisher Clips driven between the runner track and floor slab in each stud space and tapped flush to the lath. The end joints of the ROCKLATH shall occur between studs, staggered in alternate courses, and joined together at corners with B-1 BRIDJOINT Clips.

Succeeding courses of ROCKLATH shall be attached by inserting the lath into the top portion of the TL-1 Field Clips of preceding course and securing the top edge of lath to the studs with TL-1 Field Clips. The top course of ROCKLATH shall be cut to the width required, B-1 Clips placed on the previous course of lath in each stud space, and the lath secured at the ceiling angle with TL-2 Starter-Finisher Clips driven between the concrete ceiling slab and runner track.

Where ceilings are lathed, the last course of lath shall be cut to fit as required and held in place with cornerite stapled to ROCKLATH and wire-tied or stapled to ceiling lath.

Cornerite shall be used on all internal angles, and corner bead at external corners, by stapling to ROCKLATH plaster base.

### *NOTES: RELATED INCLUSIONS*

**Door Bucks:**

**A.** Under appropriate section of the specification indicate metal door bucks shall be formed of not less than 16-gauge steel, shop primed. Secure anchorage to the floor shall be by two power driven anchors or equivalent attachment through a clip at each jamb. Angle inserts shall be welded in each jamb at top, 12″ down from top and then at approximately 24″ o.c. Use runner track at head of buck to receive studs over opening, runner to turn down 6″ each side at the jambs and wire-tied to studs used as door buck struts. Secure studs to angle inserts by engaging in notches and wire-tying securely in place, using double strand of 18-gauge tie wire.

**B.** Finished width of partition will be 2″ over nominal stud width and door bucks must be furnished to provide required over-all thickness out-to-out of plaster.

**C.** If wood door bucks are to be used under appropriate section of the specifications call for rough bucks of same width as studs, and of not less than 1⅝″ stock with the jambs running to underside of construction above and well anchored top and bottom.

**Base or Grounds**

Under appropriate section of the specification call for base or grounds as follows:

**A.** For USH 2½″ Metal Base, specify the attachment of the base with USG Stud Base Clips for Metal Base wire-tied over ROCKLATH to the stud.

**B.** For portland cement or terrazzo base, specify a USG 7A base screed wire-tied over the ROCKLATH plaster base to the studs at indicated height and 2.5 diamond mesh strip lath stapled to ROCKLATH to receive portland cement plaster or terrazzo.

**C.** For wood base, specify a ⅞″ x 2½″ wood ground strip wire-tied to the studs.

**D.** For asphalt tile base cemented to plaster, specify either a ½″ x 1″ wood ground strip wire-tied over ROCKLATH to studs, or a plaster screed, to insure ½″ plaster over ROCKLATH.

**E.** Wherever metal trim is to be applied over the plaster, such as for chalk-boards, plaster screeds should be required to provide true surfaces to receive trim.

### Fixture Attachments

**A.** For stair rails, lavatories, etc., bolts welded or locked to channels, angles, or plates shall be anchored to studs prior to lathing. (See Detail, pages 7 & 8.)

**B.** For cabinets, 1″ wood grounds may be tied to studs prior to lathing or 8-A picture mould may be tied over ROCKLATH to studs. (See Detail, pages 7 & 8.)

### K. 2″ Solid ROCKLATH and Plaster Partition

Metal Base shall be attached to rough floor by nailing clips not over 24″ o.c. according to partition layout. Snap side plates over clips, cutting and bending at corners as required. (If wood floor runner is used, specify in carpentry section.)

Ceiling Runner shall be properly aligned over floor runner and securely attached.

Tie-In Shoes shall be attached to exterior walls, columns, abutting partitions, etc., by nailing, wire tying or stapling, as required, at third points of partition height.

ROCKLATH Plaster Base shall be cut in lengths to allow ¼″ minimum and 1¼″ maximum top clearance in the ceiling runner. The ROCKLATH shall be erected vertically, engaging the bottom in the groove of floor runner and either tying or clipping top to ceiling runner. Vertical edges of ROCKLATH shall be kept as plumb as possible and the V-joint edges be brought into close contact one with the other. No vertical cut edges of lath shall be used in the central portion of partition. The use of lath having cut edges shall be confined to the ends of the partition or at door bucks. ROCKLATH shall be neatly cut for electrical conduit, other piping or door struts, and one side shall be covered with paper-backed metal lath fastened to the ROCKLATH. Where ROCKLATH Plaster Base intersects other partitions, exterior walls or columns, it shall be wire tied or fastened to tie-in shoes at the third point of height.

For partitions not over 9′0″ in height, bracing shall consist of ¾″ cold rolled channels erected horizontally, with flanges turned down, just below mid-point of height. The bracing member shall extend the full length of the partition and shall be fastened to the lath by the use of tie wires looped over the channel, or USG wire bracing clip, at center of the lath in such a manner as to keep the lath joints together as well as securing the channels to the lath. It shall be similarly wire tied or clipped to the lath at channel ends.

For partitions over 6′0″ in length, the horizontal braces shall be reinforced by vertical struts every 6′0″ or fraction thereof formed from 1½″x1½″ angles (or heavier materials) fastened securely at the bottom and wedged firmly against the construction at the head. Vertical struts shall be securely wire tied to horizontal braces.

For partitions over 9′0″ in height, two horizontal braces at third points shall be used. Attach to lath in a similar manner as above.

Seasoned wood bracing members may be used in lieu of metal bracing, provided they are attached in a similar manner to hold lath rigid during initial plastering stages.

Pipe chase hollow partitions shall be constructed using two ceiling runners and two floor runners, erected to provide hollow space indicated on the plans. Horizontal ¾″ channels shall be erected at third points of height and secured to (tie-in shoes at third points of height of abutting partitions) (vertical ¾″ channels erected at both ends of pipe chase) and to intermediate vertical ¾″ channels not over 4′6″ o.c. Horizontal channels shall be cross-braced not over 30″ on center with channel brackets, wire tied to horizontal channels. Long length ROCKLATH, ½″ thick and V-edge, shall be set in floor runner, clipped or wire tied to ceiling runner, and wire tied over a nail to each intermediate horizontal channel.

### *NOTES: RELATED INCLUSIONS*

***Door Bucks:***—*Shall be as specified elsewhere. Wood bucks shall be milled according to details, of select stock, resistant to splitting and prime coated if stop is integral with the buck. Wood floor runner may be used as rough buck if separate jamb plus casing is to be used. After* ROCKLATH *Plaster Base is set in the groove, 8d coated nails shall be driven in at a 45° angle each side, approximately 12″ o.c., and bent over against the lath for subsequent anchorage in the plaster. Separate bracing is required to keep buck in* *alignment with partition and, in addition, a door templet will be required when integral finish buck is used.*

*Steel bucks shall be furnished with clip inserts for centering* ROCKLATH *in partition. If door buck struts are furnished, they shall not exceed ⅝″ in size in direction of partition thickness.*

**Fixture Attachment**—*Lightweight fixtures and trim shall be installed by drilling set dry plaster to a minimum depth of ¾″ and inserting a plastic plug for anchorage of attachment screws.*

*Cabinet and shelving grounds shall consist of ¾″ (actual dimension) by 1½″ wood strips, having 6d (minimum) coated nails driven ⅝″ into both edges at not over 12″ o.c., attached to the* ROCKLATH *by nailing, wire tying or bolting.*

*Lavatory and sink hangers on 2″ solid partitions shall be installed by wire tying an 18 gauge perforated plate of size equal to hanger (maximum 6″x24″) to opposite side of the lath and placing hanger bolts prior to plastering.*

**Ceramic Tile**—*(Where ceramic tile is required over* ROCKLATH, *diamond mesh metal lath shall be stapled over the* ROCKLATH *plaster base with staples spaced approximately 8″ on center, horizontally and vertically, and portland cement-lime plaster shall be applied in scratch and brown coats to ⅝″ grounds over lath as a base for the ceramic tile) or (Ceramic tile shall be adhesively attached over the finished gypsum plaster in accordance with adhesive manufacturer's specifications.)*

**Electrical Work**—*Electrical conduit and outlet boxes shall be specified elsewhere. Embedded conduit size shall not exceed ½″ rigid. Switch boxes and convenience outlet boxes shall not exceed 1½″ in depth and, if plaster ring is used on 4″x4″ convenience outlet boxes opening one side only, the box shall not exceed 1¼″ in depth, to provide ½″ of plaster on the back side.*

### L. Exterior Wall Furring System

Single Metal Base shall be attached to rough floor by nailing clips not over 24″ on center. Snap the side plate over the clips, cutting and bending at corners as required. (Alternate: Wood runner shall be attached to the rough floor by nailing with cut nails or concrete stub nails in the center groove or through alternate outside edges not over 16″ on center.) (If metal base is used, base must be grouted before erection of lath.)

Attach ceiling runner to the construction above as required, plumbing up from the floor runner, or install furring channel 6″ from top as specified below.

Attach furring brackets, with serrated edges up, to the masonry walls not over 4″ from columns or other abutting construction and not over 36″ on center horizontally and vertically, and as required above and below windows, using (one 2″ cut nail in mortar joints of brick, clay tile, or cement block or in the field of lightweight aggregate blocks) (⅝″ concrete stub nails or power driven nails or other suitable fasteners in monolithic concrete). Fastenings shall be driven through top hole of bracket. Furring channels shall be laid horizontally on the furring brackets with the legs down, plumbed to a line with the ceiling runner and base, and wire tied to the bracket with a double strand of 18 gauge tie wire. Excess bracket length shall be bent down.

⅜″ long length Insulating ROCKLATH shall be applied with the long length vertical and butted lightly, with the foil facing the furred space, by setting bottom of lath in the groove of the base grout, clipping top of lath to the ceiling runner and wire tying over a nail at the edges to intermediate horizontal channel furring. Cut and fit gypsum lath to allow slight clearance around window frames. Apply a 3″ strip of metal lath over each ROCKLATH joint over and under windows.

### M. ROCKLATH and Plaster Column Fireproofing

(**Note to Architect:** *For 1, 1½, 2 or 3 hour fire rating, use following lathing specification.)*

Apply ⅜″x16″x48″ Perforated ROCKLATH vertically against the column flanges and bridging the web spaces, cut as required, fastened with double strands of 18 gauge galvanized tie wire located approximately 2″ from ends of the lath and about 15″ on center at intermediate points and wrapped around the perimeter of the column. USG 1A Expanded Flange Corner Bead shall be set at each corner to establish (½″) (⅝″) (1″) (1¾″) plaster thickness over the ROCKLATH by wire tying to the double strands of 18 gauge wire.

**Note to Architect:** *For 4 hour Fire Rating, use following lathing specification:*

Apply a double thickness of ½″x24″ long length ROCKLATH vertically against the column flanges and bridging the web spaces, cut as required and fasten with a double strand of 18 gauge galvanized tie wire located about 4″ from top and bottom and 24″ on center at intermediate points and wrapped around perimeter of column. One inch hexagonal 20 gauge galvanized wire fabric shall be wrapped tightly around the column over the ROCKLATH. USG 1A Expanded Flange Corner Bead shall be wire tied to each corner to provide 1½″ plaster ground over the ROCKLATH Plaster Base.

AIA FILE NUMBER 21-A-2

TECHNICAL INFORMATION

# GYPSUM PLASTERS

## AND FINISHING LIMES

UNITED STATES GYPSUM
The Greatest Name in Building

GENERAL OFFICES—300 WEST ADAMS STREET, CHICAGO 6, ILLINOIS

AIA FILE NUMBER 21-A-2

1955

"STRUCTOLITE," "RED TOP," "BONDCRETE," "PYROBAR," "ROCKLATH," "ORIENTAL," "SABINITE," "IVORY," "GRAND PRIZE," "MORTASEAL," "CHESHIRE," "CHAMPION," "STAR," "TRUSSTEEL" and "USG" are registered trade-marks; "HI-LITE" and "STRUCTO-GAUGE" are trademarks owned by United States Gypsum and are used by it to distinguish products of its manufacture.

"STRUCTO-LITE" identifies the particular prepared plaster manufactured only by United States Gypsum.

"RED TOP" identifies the particular plasters and finishes manufactured only by United States Gypsum.

"BONDCRETE" identifies the particular plaster for concrete surfaces manufactured only by United States Gypsum.

"PYROBAR" identifies the particular gypsum partition tile manufactured only by United States Gypsum.

"ROCKLATH" identifies the particular gypsum lath or plaster base manufactured only by United States Gypsum.

"ORIENTAL" identifies the particular colored finishes manufactured only by United States Gypsum.

"SABINITE" and "HI-LITE" identify the particular acoustical plasters manufactured only by the United States Gypsum Company.

"IVORY" and "GRAND PRIZE" identify the particular hydrated lime manufactured only by the United States Gypsum Company.

"CHESHIRE" identifies the particular high calcium finishing lime manufactured only by United States Gypsum.

"MORTASEAL" identifies the particular masonry plaster manufactured by United States Gypsum.

"CHAMPION" and "STAR" identify the particular white gauging plasters manufactured only by the United States Gypsum Company.

"STRUCTO-GAUGE" identifies the particular prepared gauging plaster manufactured only by United States Gypsum.

"TRUSSTEEL" identifies the particular truss designed stud manufactured only by the United States Gypsum Company.

## RED TOP* STRUCTO-LITE* PLASTER

### DESCRIPTION

Red Top Structo-Lite plaster is a high quality basecoat plaster formulated at the mill by proportioning a select expanded perlite with gypsum plaster.

Structo-Lite is packaged in 80 lb. bags (regular) and 67 lb. bags (masonry) and requires the addition of clean water *only* on the job.

Complies with A.S.T.M. Designation C28-50 for "Gypsum Ready Mixed Plaster." The perlite used complies with ASTM Designation C35-53T "Inorganic Aggregate for use in Interior Plaster."

### FUNCTION AND UTILITY

1. **Uniformly Strong Walls**—Proper proportioning of cement plaster with a well graded, controlled-density, perlite aggregate and a mill-controlled set that help insure strength in the plaster slab.

2. **Uniform Hardness**—Because the perlite in Structo-Lite plaster is manufactured to conform with exacting specifications for density, strength and gradation, and is thoroughly mixed with the cement plaster at the mill.

3. **Over Fifty Per Cent Less Weight** in the finished plaster. Large savings in framing costs are possible due to this saving in weight.

4. **More Fire Resistant**—Greatly increased fire resistant ratings over those attained with sand in plastered walls and ceilings. Ideally suited where building code requirements demand maximum fire ratings not attainable with sand. For example:

   a. 3/8″ Perforated Rocklath plaster base attached to wood studs spaced 16″ o.c. with R-1 Resilient Clips, plastered to 1/2″ grounds with Structo-Lite—1 hr. fire rating.

   b. 3/8″ Perforated Rocklath nailed to wood joists spaced 16″ o.c. and plastered to 1/2″ grounds with Structo-Lite—1 hour fire rating.

   c. 3/8″ Perforated Rocklath attached with Brace-Tite clips to Trussteel Studs, plastered to 1/2″ grounds with Structo-Lite—1 hour fire rating.

   d. Steel joists 24″ o.c.; 2″ concrete over 3/8″ rib lath top of joists; 3/8″ perforated Rocklath attached with Brace-Tite Clips to 3/4″ channels 16″ o.c. wire-tied to joists, plastered with Structo-Lite to 5/8″ grounds—1 hour fire rating.

Structo-Lite plaster, having a mortar weight of half that of a gypsum-sand plaster proportioned 1:3, still develops comparable tensile and compressive strengths. Structo-Lite is strong, quick-drying, light weight, and easy to finish over.

"k" FACTOR = 1.4 (approximate) or about 3 times the insulation value of a gypsum-sand basecoat.

### LIMITATIONS

Same as paragraphs **2** to **8** under Limitations for use on Red Top Cement Plaster, page 4.

9. On jobs where Structo-Lite is used to plaster over radiant panel heating systems, the system must be designed by the heating engineer to allow for the insulating value of Structo-Lite. If the design did not contemplate an insulating value equivalent to that of Structo-Lite, do not use it over radiant heating panel portions of the job. See Limitation 8 referred to above.

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## RED TOP CEMENT PLASTER

### DESCRIPTION

Red Top Cement Plaster is a neat gypsum plaster requiring the addition of an aggregate and water on the job. It is the basecoat that receives the finish coat plaster.

Complies with ASTM Designation C28-50 for "Gypsum Neat Plaster" and Federal Specification SS-P-402, Type N.

### FUNCTION AND UTILITY

**RED TOP** Cement Plaster is used for scratch (1st coat) and brown (2nd coat) wherever good plastering aggregate is available.

**Fireproof**—Made from gypsum rock, it is incombustible and will not transmit high temperatures until completely calcined; a slow process. In this respect, gypsum plaster is unique. See fire test data page 6, for authoritative fire ratings.

**Adaptable**—Red Top Cement Plaster bonds firmly with Rocklath plaster base, metal lath, fiber insulation lath, Pyrobar gypsum partition tile, clay tile, porous brick and certain other approved plaster bases.

Red Top Cement Plaster is the standard of excellence for receiving such finish coats as lime, putty, keene's cement, gypsum trowel finish, gypsum float finish, Oriental* interior colored finish, acoustical plasters, etc. It is excellent base for adhesive application of acoustical tile.

Red Top Cement Plaster is plastic, permitting wide latitude in its use for plain or curved surfaces.

**Uniform**—Red Top Cement Plaster is manufactured on a nation-wide basis within narrow limits of tolerance. Its "stabilized set" minimizes the hazards due to impure water or aggregate and job conditions. Its set is adjusted for seasonal conditions.

**Strong**—When mixed with good sand according to specifications, Red Top Cement Plaster has a compressive strength up to 1,200 lbs. psi for normal mixes (see test data, page 6). It is capable of withstanding normal wear and usage for the life of the building.

**Economical**—Red Top Cement Plaster is lowest in cost of the various types of gypsum basecoats because:

The neat plaster is low in cost and is mixed with economical aggregate which increases bulk and coverage.

Red Top Cement Plaster is highly plastic, thus is easily and quickly applied by the mechanic.

Normal usage requires little or no maintenance.

### LIMITATIONS OF USE

**1.** Red Top Cement Plaster should have aggregate added strictly according to specifications. Use of too much aggregate drastically decreases its strength. Sand content is easily calculated. A No. 2 shovel full of damp sand weighs approximately 15 lbs. The light weight aggregates are generally shipped in 3 or 4 cu. ft. bags.

**2.** Two coat plastering not recommended over fiber insulation lath.

**3.** Under no conditions should Red Top Cement Plaster be applied to concrete. Use Bondcrete* Plaster, described on page 5.

**4.** Red Top Cement Plaster should not be used where contact with excessive water or moisture is expected. In such instances, use portland cement-lime plaster.

**5.** Red Top Cement Plaster is an interior basecoat plaster and should not be used on the exterior where exposed to the elements.

**6.** Because bituminous compounds do not provide an ideal base for gypsum plaster basecoats, plaster application on masonry walls and concrete that have been coated with these compounds **is not recommended.**

**7.** Due to possibility of condensation or water seepage, plastering direct to interior side of exterior masonry walls is not recommended. Furring such walls prior to plastering **is recommended.**

**8.** When used in conjunction with radiant heating systems, the temperature at the surface of the plaster shall not exceed 115° Fahrenheit. The thermal conductivity of gypsum-sand plaster is approximately three times that of a gypsum-lightweight aggregate mix.

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# BASECOAT PLASTERS

## RED TOP WOOD FIBER PLASTER

USG
RED TOP*
WOOD FIBER PLASTER
UNITED STATES GYPSUM COMPANY
*T.M. REG. U.S. PAT. OFF.
RED TOP WOOD FIBER PLASTER
RED TOP WOOD FIBER

### DESCRIPTION

Red Top Wood Fiber Plaster is a factory-prepared gypsum basecoat plaster containing finely-shredded, selected wood fiber. It requires the addition of water only on the job.

Complies with ASTM Designation C28-50 "Gypsum wood-fibered plaster" and Federal Specifications SS-P-402, Type W.

### FUNCTION AND UTILITY

**Stronger**—Compared to plaster sanded 1:3, Wood Fiber Plaster has:

3 times greater compressive and tensile strength.
2½ times greater resistance to lateral impact.
50 per cent greater surface hardness.
Consequently, has greater resistance to cracking.

**Fireproof**—Generally 50 per cent more fire resistant than sanded plaster. See ratings on page 6.

**Factory Prepared**—Particularly suitable where good aggregates are unavailable. Avoids dangers of improper proportioning of aggregates.

**Lightweight**—Dead load is 25 per cent lighter than sanded plaster.

**Cost**—A wood fiber basecoat plaster job costs approximately 10 to 15 per cent more than Red Top Cement Plaster sanded on the job.

### LIMITATIONS

Same as paragraphs 2 to 7 under Limitations for use of Red Top Cement Plaster, page 4.

## BONDCRETE* PLASTER

### DESCRIPTION

Red Top Bondcrete is a gypsum basecoat plaster specially formulated to bond with rough interior monolithic concrete surfaces. It is factory prepared, requiring addition of water only on the job.

There are no ASTM or Federal Specifications covering this type of plaster.

### FUNCTION AND UTILITY

Bondcrete is plaster especially prepared for application to concrete. It provides the bonding plaster to receive a browning, or leveling, coat of Red Top Cement Plaster or Wood Fiber Plaster when necessary.

If a leveling coat is unnecessary, the finish plaster may be applied directly to the Bondcrete.

**Bonding Strength**—Bondcrete adheres well to properly prepared concrete surfaces. See Surface Preparation under Specifications for proper conditioning of concrete surfaces. This is important.

The thermal coefficient of expansion of Bondcrete is approximately the same as for concrete.

**Low Cost**—An economical bonding coat to provide for the application of plaster direct to concrete surfaces.

### LIMITATIONS OF USE

**1.** Bondcrete should be used only on concrete that is properly prepared for plastering. It should never be applied to smooth concrete. (See Red Top Cover Coat, page 10.)

**2.** Maximum thickness of Bondcrete and basecoat shall not exceed ⅜″ on ceilings or ⅝″ on walls. If additional thickness is required, metal lath shall be secured to the concrete surfaces.

**3.** The same as paragraphs 4 to 8 under Red Top Cement Plaster, page 4.

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# BASECOAT PLASTERS

## TECHNICAL DATA—AVERAGE TEST RESULTS

**(NOTE—results from separate producing plants may vary somewhat—above or below these average figures)**

| | STRUCTO-LITE | WOOD FIBER | CEMENT PLASTER | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | SAND | | | VERMICULITE | | PERLITE | |
| MIX: | | Neat | 1:1 | 1:2 | 1:3 | 100:2 | 100:3 | 100:2 | 100:3 |
| COMPRESSIVE STRENGTH—psi (dry) | 900 | 2600 | 2100 | 1200 | 750 | 500 | 300 | 1000 | 650 |
| TENSILE STRENGTH—psi (dry) | 150 | 440 | 245 | 170 | 120 | 130 | 90 | 165 | 105 |

## FIRE TEST DATA

**(All tests made at nationally recognized fire testing laboratories)**

| PANEL TYPE | | | | RATING |
|---|---|---|---|---|
| CONSTRUCTION | TYPE BASE | PLASTER & AGGREGATE | THICKNESS | |
| **PARTITIONS** | | | | |
| Wood Frame | ⅜″ ROCKLATH Plain | Gypsum-Sand 1:2, 1:2 | ½″ | 45 Minutes |
| Wood Frame | ⅜″ ROCKLATH Plain | Gypsum Wood Fiber | ½″ | 1 Hour |
| Wood Frame | ⅜″ Perf. ROCKLATH | Gypsum-Sand 1:2, 1:2 | ½″ | 1 Hour |
| Wood Frame | ⅜″ Perf. ROCKLATH | Gypsum-Perlite 100:2½ | ½″ | 1 Hour |
| Wood Frame | ⅜″ Perf. ROCKLATH | Gypsum-Vermiculite 100:2½ | ½″ | 1 Hour |
| Wood Frame | Metal Lath | Gypsum-Sand 1:2, 1:3 | ¾″ | 45 Minutes |
| Wood Frame | Metal Lath | Gypsum-Sand 1:2, 1:2 | ¾″ | 1 Hour |
| Wood Frame | Metal Lath | Gypsum Wood Fiber | ¾″ | 1½ Hours |
| Wood Frame | Metal Lath | Gypsum-Vermiculite 100:2½, 100:3½ | ¾″ | 1 Hour |
| 3″ Hollow PYROBAR | | Gypsum-Sand 1:3 | ½″ | 3 Hours |
| 4″ Hollow PYROBAR | | Gypsum-Sand 1:3 | ½″ | 4 Hours |
| Solid | Metal Lath | Gypsum-Sand 1:2, 1:3 | 2″ | 45 Minutes |
| Solid | Metal Lath | Gypsum-Sand 1:2, 1:2 | 2″ | 1 Hour |
| Solid | Metal Lath | Gypsum-Perlite 100:2, 100:3 | 2½″ | 2 Hours |
| Solid | ROCKLATH | Gypsum-Sand 1:1, 1:2 | 2″ | 1 Hour |
| Solid | ROCKLATH | Gypsum-Perlite 100:2, 100:3 | 2″ | 1½ Hours |
| TRUSSTEEL Stud | Metal Lath | Gypsum-Sand 1:2, 1:3 | ¾″ | 45 Minutes |
| TRUSSTEEL Stud | Metal Lath | Gypsum-Sand 1:2, 1:2 | ¾″ | 1 Hour |
| TRUSSTEEL Stud | Metal Lath | Gypsum Wood Fiber | ⅞″ | 2 Hours |
| TRUSSTEEL Stud | Metal Lath | Gypsum-Perlite 100:2, 100:3 | 1″ | 2 Hours |
| TRUSSTEEL Stud | ⅜″ Perf. ROCKLATH BRACE-TITE Clips | Gypsum-Sand 1:2 or STRUCTO-LITE | ½″ | 1 Hour |
| **CEILINGS** | | | | |
| Wood Frame | ⅜″ Perf. ROCKLATH | Gypsum-Sand 1:2 | ½″ | 45 Minutes |
| Wood Frame | ⅜″ Perf. ROCKLATH (A) | Gypsum-Sand 1:2 | ½″ | 1 Hour |
| Wood Frame | ⅜″ Perf. ROCKLATH | Gypsum-Perlite 100:2½ | ½″ | 1 Hour |
| Wood Frame | Metal Lath (B) | Gypsum-Sand 1:2, 1:3 | ¾″ | 1 Hour |
| Wood Frame | Metal Lath | Gypsum Wood Fiber | ¾″ | 1 Hour |
| Steel Joist (C) | ⅜″ Perf. ROCKLATH BRACE-TITE Clips Channels 16″ o.c. | Gypsum-Perlite 100:2½ or STRUCTO-LITE | ⅝″ | 1 Hour |
| Steel Joist (C) | Same, plus 14 Ga diagonal wire connecting clips | Gypsum-Perlite 100:2½ | ½″ | 2 Hours |
| Steel Joist (C) | Same, except channels 12″ o.c. | Gypsum-Perlite 100:2½ | ⅝″ | 3 Hours |
| Steel Joist (C) | Metal Lath | Gypsum-Sand 1:2, 1:3 | ¾″ | 2 Hours |
| Steel Joist (C) | Metal Lath | Gypsum-Vermiculite 100:2, 100:3 | ¾″ | 3 Hours |
| Steel Joist (C) | Metal Lath | Gypsum Wood Fiber | 1″ | 3 Hours |
| Steel Joist (C) | Metal Lath | Gypsum-Vermiculite 100:2, 100:3 | 1″ | 4 Hours |
| Cellular Steel Floor | Metal Lath (D) | Gypsum Wood Fiber | 1″ | 4 Hours |
| Cellular Steel Floor | Metal Lath (E) | Gypsum-Vermiculite 100:2, 100:3 | 1″ | 4 Hours |
| Cellular Steel Floor | Metal Lath (D) | Gypsum-Perlite 100:2, 100:3 | 1″ | 4 Hours |
| **COLUMNS** | | | | |
| Steel Section | Metal Lath | Gypsum-Sand 1:2, 1:3 | ¾″ | 1 Hour |
| Steel Section | Metal Lath (F) | Gypsum-Perlite 100:2, 100:3 | 1″ | 2 Hours |
| Steel Section | Metal Lath (F) | Gypsum-Perlite 100:2, 100:3 | 1⅜″ | 3 Hours |
| Steel Section | Metal Lath (F) | Gypsum-Perlite 100:2, 100:3 or Structo-Lite | 2″ | 4 Hours |
| Steel Section | Pyrobar-2″ Solid, or 3″ Hollow | Gypsum-Sand 1:3 | ½″ | 4 Hours |
| Steel Section | ⅜″ Perf. ROCKLATH | Gypsum-Sand 1:2½ | ½″ | 1 Hour |
| Steel Section | ⅜″ Perf. ROCKLATH | Gypsum-Sand 1:2½ | ⅝″ | 1½ Hours |
| Steel Section | ⅜″ Perf. ROCKLATH | Gypsum-Perlite 100:2½ | 1″ | 2 Hours |
| Steel Section | ⅜″ Perf. ROCKLATH | Gypsum-Perlite 100:2½ | 1¾″ | 3 Hours |
| Steel Section | 2 layers L. L. R. L. Plus 1″ 20-ga. mesh | Gypsum-Perlite 100:2, 100:3 | 1½″ | 4 Hours |

(A) Lath applied with 1⅛″, 13 gauge nails, ⅜″ head and joints covered with Striplath. 1¾″ nails. (B) Lath applied with 1½″, 11 gauge, 7⁄16″ head barbed roofing nails, 6″ O.C. (C) 2½″ reinforced concrete slab on Riblath or 2″ precast gypsum tile above. (D) Ceiling 9″ or more below floor slab. (E) Ceiling 3″ or more below floor slab. (F) Self-furring metal lath wrapped tight to column or diamond mesh on channel frame not filled solid to column.

# FINISHING PLASTERS

## DESCRIPTION

The finish coat plaster provides the base for final wall or ceiling decoration. It is applied to a thickness of 1/16″ to 1/8″, usually over a gypsum plaster basecoat.

Several types of finish coats are available, each with characteristics to serve specific requirements, and generally classified according to the principal cementitious ingredient as follows:

**1. Lime and Gauging,** commonly known as "white coat" for a smooth white trowel finish. It consists of lime, soaked to a smooth putty, and mixed with gypsum gauging plaster. With addition of sand, is adaptable for sand float finishes. The three essentials to a good white coat job are:

a. Lime must be highly plastic and completely hydrated.

b. Correct proportioning of gauging plaster to lime putty (see specifications) and thorough blending of ingredients.

c. Careful application and sufficient trowelling to produce a smooth glossy surface.

**2. Lime and Keene's**—for extra hard smooth white trowel finish. With addition of sand, is adaptable for sand float finishes. Also available mill mixed and colored under "ORIENTAL"* Interior Finish brand.

**3. Gypsum**—Trowel (smooth), or sand float prepared finishes.

**4. Acoustical Plaster**—(SABINITE*), (USG Hi-Lite) for sound absorption. (See page 10 and AIA Folder 39-B.)

## ESSENTIALITY OF COMPLETE HYDRATION IN DOLOMITIC FINISHING LIMES

Some years ago an exhaustive investigation was undertaken by the National Bureau of Standards in co-operation with several architects and lime manufacturers to determine reasons for "lime bulges" (delamination of finish from basecoat) occurring on many government and private buildings. The failures investigated occurred on surfaces which had been "white coated" with *dolomitic* hydrated finishing limes from the Ohio fields, which have been widely used. Failures often occur 5 or 10 years after erection of the buildings.

After much analysis, it was the consensus of opinion that the delayed hydration and attendant expansion of unhydrated oxides in the "normal" dolomitic finishing limes resulted in bulging and delamination.

To correct this difficulty, United States Gypsum Company took the lead in developing "IVORY"* Double Hydrated finishing lime, a "fully" or "pressure" (less than 8 per cent unhydrated) hydrated Ohio dolomitic finishing lime.

ASTM specifications C206-49 for *special* finishing lime and proposed amendments to Federal specifications, have been written to cover 92 per cent hydrated limes; a specification has been published by the National Lime Association. This type of finishing lime is required by ASA Specifications for Gypsum Plastering, A42.1-1950.

Note that all high calcium hydrated limes (properly soaked) comply with these requirements as do high calcium quicklimes (properly slaked).

### TECHNICAL DATA—FINISH PLASTERS

| | GAUGING PLASTER TO LIME | STRUCTO-GAUGE TO LIME | | QUICK TROWELLING KEENE'S TO LIME | | GYPSUM TROWEL FINISH | GYPSUM FLOAT FINISH | ORIENTAL FINISH |
|---|---|---|---|---|---|---|---|---|
| **Mix by weight of dry materials:** | 1:2 | 1:2 Medium Hard | 1:1 Hard | 2:1 Medium Hard | 4:1 Hard | NEAT | NEAT | NEAT |
| Color | White | White | White | White | White | White | White or Gray | 7 Colors |
| Finish Texture | Smooth | Smooth | Smooth | Smooth | Smooth | Smooth | Float | Float |
| Hardness in Kilograms (†) | 34 | 56 | 108 | 50 | 70 | 55 | (‡) | (‡) |
| Workability | 1 | 1 | 2 | 4 | 7 | 3 | 6 | 5 |
| Cost Factor Labor & Mat'l. | 100 | 125 | 150 | 170 | 180 | 125 | 125 | 160 |

(†) Kilograms required to force a 10mm ball .01″ into plaster face.

(‡) These are hard finishes but the aggregate in the surface does not permit an indication with this test.

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## LIME PUTTY—GAUGING (WHITE COAT) FINISH

### DESCRIPTION

Hydrated Finishing Lime (or Finishing Quicklime) is soaked (or slaked) to putty consistency, blended in proper proportion with gypsum gauging plaster, and is trowelled to a smooth, hard finish usually over a properly prepared gypsum basecoat. This is by far the most widely used plaster finish coat due to ease of application, flexibility, whiteness and economy.

The function of lime in a finish plaster is to provide the "spread" and plasticity to permit fast, easy application with full flexibility and economy. Lime does not "set," but hardens slowly; it likewise shrinks on drying. Therefore, gypsum gauging must be blended into the lime in proper proportion to provide initial set and strength, and to avoid shrinkage cracks.

**IVORY***—A double hydrated (over 92%) special finishing lime that will not expand measurably in the wall. *Requires no soaking* to produce a smooth, uniform, white, highly plastic putty. May be mixed by adding dry lime to water in mechanical mixer because it develops its normal plasticity almost immediately then adding gauging. This is the preferred lime. Meets ASTM Designation C206-49 Type S and Federal Specification SS-L-351, Type F, including the added requirement of not more than 8% unhydrated oxides.

**RED TOP and GRAND PRIZE***—Shipped from *Genoa, Ohio*, are normal dolomitic hydrated finishing limes, and are only partially hydrated. They comply with ASTM Designation C6-46, Type N, and Federal Specification SS-L-351, Type F, but do not comply with specifications limiting the unhydrated oxides to 8 per cent.

**RED TOP Hydrated Limes** shipped from *Farnams, Massachusetts* and *New Braunfels, Texas*, are high calcium limes and are completely hydrated. They comply with ASTM C206-49 Type S and Federal Specification SS-L-351, and meet specifications limiting the unhydrated oxides to not more than 8 per cent.

All types of USG* hydrated lime except Ivory Finish Hydrate require overnight soaking. They yield a smooth, highly plastic putty of exceptional purity. Until the advent of pressure hydrates, such as Ivory, they were the standards of excellence.

**RED TOP and CHESHIRE Brands**—Are high calcium finishing quicklimes. When properly slaked and aged for at least 16 hours, hydration is complete, (over 92%) thereby insuring against further hydration and attendant possibilities of expansion on the wall. Comply with ASTM Designation C5-26, and Federal Specification SS-Q-351. They have unusually high plasticity and purity.

## GAUGING PLASTERS

1. **CHAMPION*** and **STAR*** are **WHITE** Gauging Plasters, for blending with lime putty to provide initial set and strength. They are ground to the proper fineness to blend readily and completely, thus minimizing the danger of check-cracking, crazing, etc. when properly used. They give strength and hardness to the surface finish. Champion has a quicker "set" than Star Gauging Plaster. They are the preferred gauging plasters because of the extreme whiteness of the finish when used with limes of high purity.

Complies with ASTM Designation C28-50 "Calcined gypsum for finishing coat" and Federal Specification SS-P-402, Type G.

2. **RED TOP GAUGING** is a "local" gauging plaster, so called because it is made from a rock grade that is used in basecoat plasters. It is available with slow or fast "set." It is distinguished from White Gauging Plasters by its darker color. Except for color, Red Top Gauging Plasters are the equal of Champion and Star Gauging Plasters.

Compliance is the same as for "white" gauging plasters above.

3. **STRUCTO-GAUGE** is a new high strength gypsum gauging plaster for use with lime-putty to produce surfaces of extreme hardness and durability, designed for use in hospitals, schools and other buildings where a hard finish is desired. Structo-Gauge has excellent mixing qualities, applies easily and requires a minimum of troweling to produce a smooth finish.

Complies with ASTM Designation C28-50 "Calcined gypsum for finishing coat and Federal Specification SS-P-402, Type G, and, in addition, has a compressive strength (dry) of not less than 5000 psi.

### PROPORTIONING—See Specifications

### LIMITATIONS OF USE

**1.** For interior application only.

**2.** Recommended proportioning must be observed. Failure to use sufficient gauging plaster, to blend thoroughly, or to trowel adequately often results in check-cracking, crazing, lack of hardness and bond failure.

**3.** Designed for normal humidity conditions. Where higher humidity or exposure to wetting is expected, use Keene's Cement or Structo-Gauge.* If humidity or exposure to moisture is extreme or continuous, use portland cement-lime plaster.

**4.** Designed for normal usage. If greater hardness, and resistance to abrasion are required, use Keene's cement or Structo-Gauge.

**5.** Must be applied to gypsum or lime plaster basecoat. The bond of lime putty gauging finish to portland cement plasters is inadequate. Do not apply direct to masonry.

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## KEENE'S-LIME FINISH

### DESCRIPTION

Red Top keene's cement is a high strength, white gypsum plaster. Keene's-lime finish is composed of lime putty blended with keene's cement in proportions required to obtain desired hardness.

Complies with ASTM Designation C61-40 and Federal Specification SS-C-161, Type I (Regular) and Type II (Quick Troweling).

### FUNCTION AND UTILITY

In addition to those listed for lime putty-gauging, are:

**Resistance to Abrasion.** Keene's cement has exceptionally high strength and surface hardness. See Technical Data on page 7.

**Low Water Absorption.** Keene's cement, having a high density, has low water absorption.

**Choice of Hardness.** Keene's cement is mixed with lime putty in varying proportions for "hard" and "medium hard" finishes. See Technical Data and specifications.

**Two Types.** Regular and Quick Troweling. Regular keene's sets slowly, requires more troweling and may be used with any proportion of lime.

Quick Troweling keene's sets faster, requires less troweling and must be used with a minimum of 25 lbs. of dry hydrated lime per 100 lbs. of keene's cement.

### LIMITATIONS OF USE

**1.** Keene's cement is for interior finishes only.

**2.** Keene's cement finish is not recommended where exposure to water is extreme or continuous. Use portland cement-lime plaster.

**3.** For application over gypsum basecoats of high compressive strength only.

## MOULDING PLASTERS

Moulding Plasters are made for use in specialized work such as casting ornamental enrichments or running cornice. Moulding Plasters may be used either neat or with the addition of lime putty. In cast work, moulding plaster is used neat whereas for running cornice a small portion of lime is used. Moulding Plaster is available in white and local grades as well as in quick or slow set.

## CASTING PLASTER

Red Top Superfine Casting is similar to Red Top White Moulding Plaster except that it has a much finer particle size. It is ideal for use in modeling done directly in the plaster. The fine particle size results in smoother castings showing excellent detail—important in the making of fine plaques and art statuary. Only water is added in mixing.

## PREPARED GYPSUM FINISHES

### RED TOP Gypsum Trowel Finish and RED TOP Gypsum Sand Float Finish

### DESCRIPTION

Red Top Trowel and Sand Float finishes are mill-prepared gypsum finish coat plasters requiring the addition of water only.

There are no ASTM or Federal Specifications covering this type of plaster.

### FUNCTION AND UTILITY

**RED TOP Gypsum Trowel Finish**—is used where hard, smooth surfaces are desired.

**RED TOP Gypsum Sand Float Finish**—is used where a quality float finish is desired.

**Strength**—approximately twice the strength of ordinary lime-gauging finishes.

**Early Decoration**—may be painted as soon as set and dry.

**Factory Prepared**—mill selection of ingredients and formulation insure uniform results and avoid variations possible with job mixing.

**Non-Alkaline**—contain nothing injurious to paint or decorations.

**Bond**—provides durable and natural bond to gypsum basecoat.

**Cost**—slightly higher than job-prepared finishes.

### LIMITATIONS

**1.** Designed for application over gypsum basecoats only.

**2.** Should not be used on exterior surfaces where exposed to the elements or on interiors exposed to excessive moisture.

## RED TOP COVER COAT FINISHING PLASTER

### DESCRIPTION

Red Top Cover Coat is a mill prepared white gypsum bonding-finishing plaster requiring the addition of water only.

### FUNCTION AND UTILITY

Red Top Cover Coat is a specially prepared finishing plaster designed to furnish an adhesive bond for application direct to smooth unpainted concrete (to which application of Bondcrete is not suited) and provide a finish surface ready for decoration.

Application specifications provide for one coat work, which is most economical and provides customary finish appearance; and two coat work, which provides a superior finish appearance. If sand float finish is desired, it must be two coat work.

### LIMITATIONS

1. For interior application only.
2. Not recommended for application on exterior masonry walls.
3. Not designed for use on surfaces which are exposed to excessive humidity or where frequent exposure to water is expected.
4. Unprotected steel in surface of concrete may result in rust spots on Cover Coat, requiring subsequent decoration.
5. As a finishing plaster it is designed for application in a total thickness not to exceed an average of 1/8 of an inch.

## ORIENTAL* INTERIOR COLORED FINISHES

### DESCRIPTION

Oriental Interior Finish is a mill-prepared and colored finish plaster requiring the addition of water only.

There are no ASTM or Federal Specifications covering this type of plaster.

### FUNCTION AND UTILITY

**Integrally Colored** at factory, requiring no decoration. Permits early occupancy. Avoids variations of color intensity that are possible when colors are mixed at site.

**Colors** (with LIGHT REFLECTION for float finish).

White—81%; Pewter Gray—52%;
Surf Green—56%; Old Ivory—77%;
Desert Rose—56%; Azure—58%;
Sahara Gold—63%.

**Texture**—A finely floated surface or special textured finish may be obtained.

**Strength**—highly resistant to abrasion due to very great hardness.

### LIMITATIONS OF USE

1. Oriental Interior is for producing finely floated surfaces or textures. Do not use for a smooth finish.
2. To be used on interiors only.

## ACOUSTICAL PLASTER FINISHES (See full data on pages 2 and 3 Sec. 10a–uni)

### SABINITE* ACOUSTICAL PLASTER

### DESCRIPTION

Sabinite Trowel Finish is a highly efficient acoustical plaster, scientifically prepared to produce a continuous *trowel or float finish* of exceptional sound absorbent qualities. It is manufactured in four standard colors and white and requires the addition of water only. Basically mineral, it is incombustible.

### HI-LITE ACOUSTICAL PLASTER

### DESCRIPTION

Hi-Lite Acoustical Plaster is a highly efficient acoustical plaster with exceptional light reflecting qualities which provides a stipple, or stipple perforated finish. Having a harder surface than Sabinite finish, it is more suitable for side walls above wainscots which require sound conditioning. It is manufactured in white only and requires the addition of water only.

### LIMITATIONS (Both Types)

1. Designed for use on ceilings and areas not exposed to rough usage.
2. To insure best results, acoustical plasters must be applied in strict accordance with manufacturer's directions.
3. Not recommended over radiant heated panel areas, due to low thermal conductivities.

**Trademark Reg. U. S. Pat. Off.*

# EXTERIOR STUCCO FINISH

## ORIENTAL EXTERIOR COLORED FINISHES

### DESCRIPTION

ORIENTAL Exterior Finish is a factory-prepared stucco for exterior application over a portland cement-lime basecoat. It requires the addition of water only on the job.

**Colors:** Pewter Gray, Eggshell Ivory, Sun Tan, Stone Gray, Copper Rose, Alamo Buff, Mission Green, Cascade Green, Pueblo Tan, Indian Coral, Rancho Brown and White.

### FUNCTION AND UTILITY

**Factory Prepared**—Uniformity in formulation insures endurance under all weather conditions. Avoids possibility of job-mixing errors.

**Integral Coloring**—Prevents variations possible where colors are added at site.

**Decoration**—Requires none.

**Adaptable** to any texture.

### LIMITATIONS

1. Not designed for use as a smooth trowel finish.
2. Requires a portland cement-lime basecoat.

## EXTERIOR STUCCO BASECOAT

### DESCRIPTION

Exterior stucco basecoat is prepared on the job from portland cement, lime, sand and water and is the basecoat that receives the ORIENTAL* Exterior (colored) Finish.

### FUNCTION AND UTILITY

Exterior stucco basecoat is used for the scratch (first coat) and brown (second coat) over cement block or clay tile, or over sheathing to which STUCCO MESH or self-furring metal lath has been properly applied.

**Fire Resistant**—Made from portland cement, lime and sand, it will not support combustion.

**Weather Resistant**—Suitable for normal exposure to climatic variations.

**Strong**—Properly mixed and cured, it provides a dense, hard base that will withstand normal wear and usage.

**Economical**—Use of standard, readily available materials provides a low cost basecoat.

### LIMITATIONS OF USE

1. Because of the use of portland cement, each coat requires curing with water after set.
2. Must not be applied in freezing weather or over bases containing frost.
3. Must not be used on smooth, dense surfaces or over old, unsound stucco unless stucco mesh reinforcement is first properly applied.

## INTERIOR PORTLAND CEMENT-LIME PLASTER

### DESCRIPTION

Portland cement-lime plaster basecoat is prepared on the job from portland cement, lime, sand, and water.

### FUNCTION AND UTILITY

A portland cement-lime plaster is used for the basecoat over cement block, clay tile, or metal lath as a base for ceramic tile or in areas subject to high moisture conditions.

It is incombustible and strong.

### LIMITATIONS OF USE

1. Because of the use of portland cement, each coat requires curing with water after set.
2. Must not be used over smooth, dense surfaces, gypsum lath or gypsum block without first securing metal lath to such surfaces.
3. Provisions for relief of setting and drying shrinkage should be made at locations such as ceiling-wall intersections, beams, columns, or fixtures passing through the plaster. Construction joints should be provided to avoid excessive continuous areas.

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**Trademarks Reg. U. S. Pat. Off.*

## X. BASE COAT APPLICATION

a. For two coat work over gypsum lath and masonry, the base (first) coat shall be applied with sufficient material and pressure to form a good bond on the gypsum lath or masonry, as the case may be, and to cover well, and then be doubled back to bring the plaster out to grounds, straightened to a true surface with rod and darby, and left rough, ready to receive the finish (second) coat.

b. For three coat work, the scratch (first) coat shall be applied with sufficient material and pressure to form good full keys on metal lath, and a good bond on gypsum or fiber insulation lath, as the case may be, and to cover well, and then be cross scratched to a rough surface. The brown (second) coat shall be applied after the scratch (first) coat has set firm and hard, brought out to grounds and straightened to a true surface with rod and darby and left rough, ready to receive the finish (third) coat.

c. For 2″ solid gypsum lath and plaster partitions, apply a scratch coat of plaster with a maximum 3 hour set, about ⅜″ thick, to each side of the lath. In no case, shall application of scratch coat to second side of lath be delayed longer than the setting time of the scratch coat applied to the first side. Scratch lightly in horizontal direction only.

After the scratch coats have set firmly and have partially dried (but not less than 16 hours), the brown coat shall be applied to the unbraced side, bringing it out to within 1/16″ of ground dimension for finish coat to bring overall partition thickness to 2 inches. When brown coat has set firmly (but not less than 3 hours), braces shall be carefully removed from opposite side and brown coat applied to that side in a manner similar to that described for the other brown coat.

d. For 2″ solid studless metal lath and plaster partitions apply scratch coat and allow it to set and partially dry. Then apply brown coat to side opposite braces, allowing it to set thoroughly before removing temporary braces. Next apply brown coat to previously braced side, bringing it out to sufficent grounds to make overall partition thickness 2″ when finish coats are applied to both sides.

e. For 2″ channel stud, metal lath and plaster partitions apply scratch coat on lath side and allow it to set and partially dry. Then apply back-up coat on channel side applied to full grounds in not less than two operations and allow to set. Next apply brown coat on lath side bringing it out to sufficient thickness to make overall partition thickness 2″ when finish coats are applied to both sides.

f. For resilient Rocklath ceilings, three coat plaster work shall be used. Apply a full scratch coat, cross rake and allow to set. Then apply brown coat to bring total thickness of plaster to 7/16″ over the lath, darby level and leave rough ready for finish coat.

g. For (exterior wall furring) (hollow partitions) having long length Rocklath three coat plaster work shall be used to a total thickness of ¾″ over the lath.

h. For column fireproofing total thickness of plaster over lath face shall be (½″) (⅝″) (1″) (1⅜″) (1¾″). Apply a full scratch coat, cross rake and allow to set. Then apply brown coat to within 1/16″ of thickness required and leave level and rough ready for application of finish coat.

i. Where plaster finish is flush with metal bases, bucks, window frames or similar constructions, both the brown coat and the finish coat should be grooved back at the intersection to reduce possibility of chipping of plaster at these points.

j. At windows, doors and other openings all base coat plaster across head of opening and 12 inches down, each side, shall be cut free of buck, frame or grounds with edge of trowel, after stiffening but before setting, to allow for expansion.

k. Scratch coat of (Exterior stucco) (Portland cement—Lime plaster) shall be applied in a full ⅜″ coat, with sufficient pressure to form a good bond with masonry surfaces or to force it through and completely embed the metal reinforcement. Cross scratch and, after set, damp cure for not less than 48 hours.

Brown coat shall be applied over the dampened scratch coat in a full ⅜″ coat with sufficient pressure to form a good bond, rodded level and left rough, using a broom if necessary. After set, damp cure for at least 48 hours before applying the finish (third) coat.

Damp curing of each coat shall be accomplished by applying water in a fine, fog spray. Apply only as much water as is readily absorbed. The frequency of spraying required will depend on the weather exposure, more frequent applications being required during hot, dry and windy weather.

## XI. PREPARATION OF LIME PUTTY

Ivory Finishing Lime shall be mixed with clean water only, using approximately 5½ to 6 gallons per bag. The putty may be prepared by overnight soak, or by mixing by hand or machine. Run mixer for sufficient time to get a smooth, thoroughly mixed putty which can be used immediately or run into a box for use as required. When stored in a box after mixing, do not permit putty to get crusty or to dry out. Mixer, tools and equipment must be clean.

## XII. PROPORTIONS OF FINISH COATS

a. Gypsum gauged lime putty finish shall be mixed in the proportions of 100 pounds of gauging plaster to 200 pounds of dry lime (400 pounds, or 34 gallons, of lime putty).

b. Medium hard Structo-Gauge-Lime Putty Finish shall be mixed in the proportion of 100 pounds of (Structo-Gauge) to 200 pounds of dry lime (400 pounds, or 34 gallons, of lime putty).

c. Hard Structo-Gauge-Lime Putty Finish shall be mixed in the proportion of 100 pounds of Structo-Gauge to 100 pounds of dry lime (200 pounds, or 17 gallons, of lime putty).

d. Medium hard Keene's Cement-Lime Putty Finish shall be mixed in the proportion of 100 pounds of Keene's Cement to 50 pounds of dry lime (100 pounds, or 8½ gallons of lime putty).

e. Hard Keene's Cement-Lime Putty Finish shall be mixed in the proportion of 100 pounds of Keene's Cement to 25 pounds of dry lime (50 pounds, or 4¼ gallons of lime putty).

f. Keene's Cement-Sand Float Finish shall be mixed in the proportion of 100 pounds of Keene's Cement to 50 pounds of dry lime and 400 pounds of sand (100 pounds, or 8½ gallons of lime putty and 4 to 5 cubic feet of sand (27 No. 2 shovels of sand).

g. Red Top Gypsum Trowel Finish shall be mixed with clean water only to proper application consistency.

h. Red Top Sand Float Finish shall be mixed with clean water only to proper application consistency.

i. Oriental Interior Colored Finish shall be mixed with clean water only to proper application consistency.

j. Red Top Cover Coat Finishing Plaster, for smooth finish, shall be mixed with clean, *warm* water only. For sand float finish, 1½ parts of silica sand by weight to one part of Cover Coat shall be added in the finish coat only.

k. Oriental Exterior Colored Finish shall be mixed with clean water only to proper application consistency.

## XIII. APPLICATION OF FINISH COATS

Finish coat shall be applied over a partially dry, level and roughened gypsum base coat. NOTE: *Except Cover Coat Finishing Plaster, which shall be applied over Cover Coat Bonder direct to concrete, and* Sabinite *or* Hi-Lite *Acoustical Plaster, which may be applied over emulsified asphalt.*

The finish coat shall be scratched in thoroughly and immediately doubled back to fill out to a true, even surface. Thickness to be 1/16″ to ⅛″. (Except Acoustical Plaster which shall be ½″ thick.)

a. Trowel finishes shall be water troweled during set to provide a smooth, dense surface for decoration, free of irregularities and blemishes.

b. Float finishes shall be floated with shingle, wood, carpet or rubber float to bring aggregate to the surface and produce a finish free of slick spots, cat faces, and other blemishes. In natural color finishes, use water sparingly while floating. Do not use water while floating colored finishes.

c. Textures shall be applied in such a manner that they will match the sample approved by the architect.

d. Sabinite Acoustical Plaster finish shall be applied according to manufacturer's directions which are hereby made a part of this specification.

e. Hi-Lite Acoustical Plaster finish shall be applied according to manufacturer's directions, which are hereby made a part of this specification.

f. (1) Cover Coat shall be applied in one coat over a properly prepared and dry concrete surface by scratching in a thin coat completely covering the concrete and doubling back with a thin coat, levelling out the surface with light trowelling. When the finish has taken up, trowel with water to a smooth, level surface. Total thickness not to exceed an average of ⅛″.

f. (2) Cover Coat shall be applied in two coats over a properly prepared and dry concrete surface by scratching in a thin coat completely covering the concrete and allowing it to set and dry. Second coat shall be then applied, covering first coat evenly and levelling out the surface with light trowelling. When finish has taken up, trowel with water to a smooth, level surface, float with sponge or shingle to a uniformly sandy textured finish. Total thickness not to exceed an average of ⅛″.

g. Ornamental plaster shall be executed in accordance with the full-sized details shown on the drawings. Cornices and moldings shall be run full, straight and true with molding plaster, using clean cut metal templets conforming to the profiles shown on the drawings. Lines shall be in alignment, with true intersections, and accurate mitres at corners and angles. Enriched ornamental work which cannot be run in place shall be cast with casting plaster in gelatine molds. The work shall be solidly backed with jute or burlap, shall be properly reinforced with galvanized iron, and shall be securely stuck and wired in place with copper wires not lighter than 16 gauge. All joints shall be carefully made and neatly pointed so as to be invisible. All rough spots shall be eliminated with fine sandpaper, and the entire work left in proper condition, ready for decoration.

h. Oriental Exterior colored finish shall be mixed and applied in strict accordance with the manufacturer's directions. Color and texture to be designated and approved by the architect or his representative.

## XIV. PATCHING

Point up around trim and other work. Cut out and patch defective and damaged plaster. Patching of plaster shall match existing work in texture and finish and joinings with plaster previously applied shall finish flush and smooth.

## XV. COMPLETION

At the completion of the finish plaster work, clean all plaster from beads, screeds, metal base and metal trim, leaving work ready for decoration by others. Remove all plaster rubbish from the building, leaving floors broom clean. Remove excess material from the job site. Remove all scaffolding, tools and other equipment from the building and job site.

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GYPSUM

AIA FILE NUMBER 23-L

**TECHNICAL INFORMATION**

# SHEETROCK*

# GYPSUM WALLBOARD

**UNITED STATES GYPSUM**
The Greatest Name in Building

GENERAL OFFICES—300 WEST ADAMS STREET, CHICAGO 6, ILLINOIS

1955

*T. M. Reg. U. S. Pat. Off.

AIA FILE NUMBER 23-L

# SHEETROCK* GYPSUM WALLBOARD

## DESCRIPTION

Sheetrock is a mill fabricated gypsum wallboard composed essentially of a fireproof gypsum core encased in a heavy manila-finished paper on the face side and a strong liner paper on the back side. The face paper is folded around the long edges to reinforce and protect the core, and the ends are square cut and smoothly finished. The joints between adjacent boards may be reinforced and concealed with the Perf-A-Tape Joint System, or may be featured by leaving exposed or covering with a decorative moulding.

Without the addition of plaster, Sheetrock wallboard furnishes to interior walls and ceilings a durable surface suitable for any type of decorative treatment, and permits repeated redecoration during the life of the building.

## FUNCTION AND UTILITY

Sheetrock wallboard provides the following features:

**Dry Walls.** Mill fabricated boards eliminate excessive moisture in construction.

**Fireproof.** The gypsum core will not support combustion, or transmit temperatures greatly in excess of 212° F. until completely calcined,—a slow process. See technical data for Fire Resistance Ratings.

**Crack Resistance.** "Welded" together by the Perf-A-Tape* Joint System, Sheetrock wallboard forms walls and ceilings exceptionally resistant to cracks caused by frame movement, vibration, or minor settlement.

**Speed.** Mill fabricated boards are easily cut and quickly applied.

**Quick Decoration.** Essentially a "dry" material, Sheetrock wallboard permits painting or other decoration, and the installation of metal or wood trim, almost immediately.

**Non-Warping.** Expansion or contraction under normal atmospheric changes is negligible and does not cause warping or buckling.

## LIMITATIONS OF USE

1. Not recommended where exposure to moisture is extreme or continuous.

2. Must be adequately protected against wetting when used as a base for tile. For such use see detailed instructions.

3. Maximum Spacing of Framing Members: ½″ Sheetrock wallboard is designed for use on framing centers from 16″ to 24″; ⅜″ and ¼″ Sheetrock, on centers up to 16″. Sheetrock wallboard used on 24″ centers on ceilings must be applied horizontally and joints reinforced. When so applied, the use of headers behind butt joints are not required. 24″ spacing is not recommended for ceilings carrying insulation fill.

4. The Perf-A-Tape Joint System requires normal to good drying conditions. It is recommended that heat be provided when temperatures fall below 55°F.

5. Application of Sheetrock over ¾″ wood furring applied across framing, rather than on a solid backing, is not recommended since the relative flexibility of the furring under impact of the hammer tends to loosen nails already driven.

## STANDARD SPECIFICATIONS

Sheetrock wallboard complies with the following Standard Specifications for Gypsum Wallboard: Federal Specification SS-W-51a. American Society for Testing Materials Specification ASTM C36-52.

# SHEETROCK WALLBOARD PRODUCTS

## TAPERED EDGE SHEETROCK

The long edges are tapered on the face side to form a shallow channel for the joint reinforcement, providing smooth, continuous wall and ceiling surfaces. The Ivory colored face paper is suitable for any type of decoration. Tapered Edge is a marked improvement over, and has supplanted, recessed edge formation. Made in two thicknesses:

**One-Half Inch.** ½″ Tapered Edge Sheetrock is recommended for single layer use in new residential construction, with all joints reinforced and concealed with the Perf-A-Tape Joint System. The greater thickness provides increased resistance to fire exposure and to the transmission of sound.

**Three-Eighths Inch.** Differs from ½″ Tapered Edge Sheetrock only in thickness and weight; is recommended for remodel and repair work where the greater strength and rigidity of ½″ board is not required.

*Sizes:* Tapered Edge Sheetrock is 4′ wide by 6′, 7′, 8′, 9′, 10′, or 12′ long.

**"USG," "SHEETROCK," "PERF-A-TAPE," "BAXBOARD" and "TEXOLITE," are registered trademarks owned by United States Gypsum and used by it to distinguish its products. "USG" identifies the particular gypsum board sheathing, "SHEETROCK" and "BAXBOARD" identify the particular gypsum wallboards, "PERF-A-TAPE" identifies the particular joint sealing tape and "TEXOLITE" identifies the particular interior paint manufactured only by United States Gypsum.**

**Trademark Reg. U. S. Pat. Off.*

# SHEETROCK WALLBOARD PRODUCTS—Cont.

## SHEETROCK FIRECODE 60 and FIRECODE 45

5/8″ Sheetrock Firecode 60 and 1/2″ Sheetrock Firecode 45 are gypsum wallboards which combine all the advantages of regular Sheetrock with increased resistance to fire exposure—the result of a specially formulated core containing special mineral materials.

By Underwriters' Laboratories tests, Sheetrock Firecode 60 and Sheetrock Firecode 45 afford 60 minute and 45 minute fire resistance ratings, respectively, when used in partition and in floor and ceiling constructions.

Firecode Sheetrock products are made with Tapered Edges only.

Sizes: 4′ wide by 6′, 7′, 8′, 9′, 10′, or 12′ long.

### Limitations of Use

1. In order to attain the 1 hour and the 45 minute fire resistance ratings, the construction of the partition and/or floor and ceiling assemblies must be in accordance with the respective Underwriters Laboratories, Inc., panel designs. See Technical Data, for description of panel constructions.
2. Maximum Spacing of Framing Members: 16″ o.c. where fire rating required, otherwise 24″.
3. Not recommended where exposure to moisture is extreme or continuous.

## INSULATING SHEETROCK

Insulating Sheetrock wallboard is made by laminating a sheet of bright aluminum foil on the back surface of regular Sheetrock.

**Insulation.** The bright metal foil has the property of reducing heat flow out of the home in the winter, and into the home in the summer. The thermal insulating value of an air space faced with Insulating Sheetrock, properly applied in a wall, is equivalent to that of 1/2″ fiber insulating board. On ceilings, in summer, it is equivalent to approximately 2″ thickness of fiber insulating board. See Technical Data, for thermal coefficients.

**Vapor Barrier.** Insulating Sheetrock provides an efficient vapor barrier which resists the passage of moisture vapor through the interior lining of exterior walls, and minimizes the possibility of condensation within the wall, and of consequent failure of the exterior paint film. See Technical Data for complete discussion and Vapor Permeability figures.

## BEVELED EDGE SHEETROCK

The long edges are precision beveled on the face side at the mill. Where featured rather than concealed joints are desired, Beveled Edge Sheetrock provides an interesting "V" joint pattern between boards. The board should be erected according to a pre-determined layout so that all joints in the room form a pleasing pattern. Since all joints must fall on framing members, they must be placed accordingly.

Sizes: 3/8″ thickness only, by 4′ wide by 6′, 7′, 8′, 9′, 10′, or 12′ long.

## SQUARE EDGE SHEETROCK

Primarily used for temporary or industrial construction, Square Edge Sheetrock is made in 1/2″, 3/8″, and 1/4″ thicknesses for use with batten strips or other decorative joint treatment.

**Quarter-Inch.** A lightweight, low cost, utility gypsum wallboard, made only with square edges, and easily erected over old wall and ceiling surfaces.

Sizes: Square Edge Sheetrock is 4′ wide by 6′, 7′, 8′, 9′, 10′, or 12′ long.

## WOODGRAINED SHEETROCK

A special paper, printed with photographic reproductions of carefully selected Knotty Pine, Walnut, and Bleached Mahogany panels, is laminated to the face of regular Sheetrock wallboard to produce a board having all the regular advantages, except reinforced joints, plus the economy of uniquely realistic appearing woodgrained predecoration. The factory finish may be further treated by applying either paste wax or satin finish varnish.

Standard in 3/8″ thickness with beveled edges for Bleached Mahogany finish, and square edges for Knotty Pine and Planked Walnut finishes. Colored nails used for inconspicuous nailing. All joints must fall on framing members.

Sizes: 4′ wide by 6′, 7′, 8′, 9′, 10′, or 12′ long.

## BAXBORD*

Designed for use as a base layer for job-laminated Sheetrock Double-Wall and Panel Sheetrock constructions, Baxbord is a low-cost, easy-to-handle gypsum board encased on both sides in strong liner paper.

Size: 3/8″x2′x8′, Square Edge.

# PANEL SHEETROCK PRODUCTS

Panel Sheetrock products have the same core composition as regular Sheetrock products, and differ only in width and edge formation. They are made in 16″ *widths only*, with long edges rounded, and in the following three finishes:

**Plain Panel SHEETROCK.** Face surface is highly calendared manila paper suitable for any type of decorative treatment.

**Knotty Pine Panel SHEETROCK.** Face surface is high quality paper on which an accurate photographic reproduction of selected random width knotty pine is printed in color.

**Striated Panel SHEETROCK.** Face surface is a handsome pattern of lengthwise striations of varied widths and depths, pre-decorated in a neutral tone to accentuate the pattern.

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# PANEL SHEETROCK PRODUCTS—CONT.

## FUNCTION AND UTILITY

Panel SHEETROCK is recommended for use over old or new gypsum wallboard, plaster surfaces or by nailing directly to studs. It has all the advantages of regular SHEETROCK, plus the following qualities:

**Attractive Panel Joints.** The 16″ wide round edge units are butted together to feature the joint, making a pleasing panel effect. No further treatment of the joint is necessary.

**Ease of Handling.** Only 16″ wide, it is easy to carry into buildings and up narrow or turning stairs, to finish "hard to get at" attic or basement spaces.

**Quick, Easy Erection.** Can be erected quicker and with fewer tools than hanging wallpaper. Experience and skill unnecessary.

**No Face Nailing—No Nailheads to Conceal.** Adhesively applied; face nails unnecessary except to hold occasional panels to an unusually uneven base, or on sloping surfaces.

## PANEL SHEETROCK APPLICATION

### Surface Preparation

**1. New Construction.** A base layer of 3/8″ BAXBORD is applied horizontally with end joints staggered on supports and is secured in place with 4d nails spaced 8″ o.c., 4 nails per board per support.

**2. Repair and Remodel.** Where Panel SHEETROCK Products are to be applied over existing gypsum wallboard or plastered surfaces, all wallpaper, calcimine and poorly adhered, loose or scaly paint must be removed. Where surfaces are textured in a medium to coarse pattern, the high points of such textures must be taken off by appropriate means. The use of Panel SHEETROCK is not recommended over textured areas having patterns so coarse as to prevent reasonable continuity of contact between the adhesive ribbons and the wall surface.

Plastered surfaces must be reasonably sound and true. If sizeable areas are loose, badly cracked or poorly bonded to plaster base, they must be removed and such areas brought out into reasonably continuous plane with general wall surfaces by firmly nailing in place BAXBORD, cut to fit, and shimmed out as required.

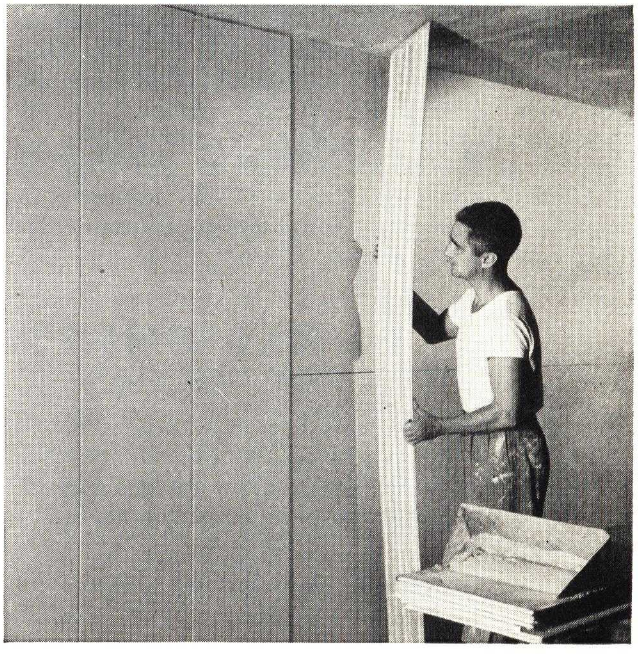
### Walls

Panel SHEETROCK is adhesively applied in a vertical direction in new construction over BAXBORD. The long edges of Panel SHEETROCK are so located as to occur between the underlying framing members. PERF-A-TAPE Cement is the adhesive which is applied to the back of each unit with a U S G Adhesive Spreader so as to provide three full, continuous and uniform ribbons of adhesive approximately 3/8″ wide at their base and 1/2″ high. The starting panel is placed vertically in light contact with the base. The preferred starting point is a corner of the room. The leading edge of the starting panel is plumbed and adequate hand pressure then applied to establish firm contact of all ribbons of adhesive over their full length with the backing. Each panel is held in place until the adhesive hardens by nails driven top and bottom in areas to be covered later by picture moulding, base trim, window trim, door trim, corner reinforcing, etc. Succeeding units are similarly applied, bringing edges of all units into firm contact. If necessary, this can be accomplished by firmly impacting a piece of 2″ x 4″ about 12″ shorter than the height of the units against the leading edge of the unit.

**Applying adhesive to the back of panel**

### Corners

At all internal vertical corners, the edge of the Panel SHEETROCK units on one abutting wall are finished neatly against the surface of that on the other wall. At all external vertical corners, the edges of the units on abutting surfaces are fitted neatly against each other. When Plain Panel SHEETROCK is used, all interior corners are reinforced and finished with PERF-A-TAPE Joint System. The external corners are protected with PERF-A-TAPE Joint System or PERF-A-BEAD. The external corners of striated and Knotty Pine Panel SHEETROCK are protected with wood trim.



**Applying panel to base layer**

# SHEETROCK WALLBOARD DOUBLE WALL SYSTEM

## DESCRIPTION

The Double Wall System consists of a layer of BAXBORD applied at right angles to the studs and joists, with end joints staggered and positioned between framing members, and a face layer of 3/8″ SHEETROCK adhesively attached thereon with PERF-A-TAPE Cement. Joints between the two layers are to be offset at least 10″ and joinings between the boards of the face layer are reinforced and concealed by the PERF-A-TAPE Joint System in the conventional manner. The resulting wall and ceiling construction has many advantages over single layer gypsum wallboard construction.

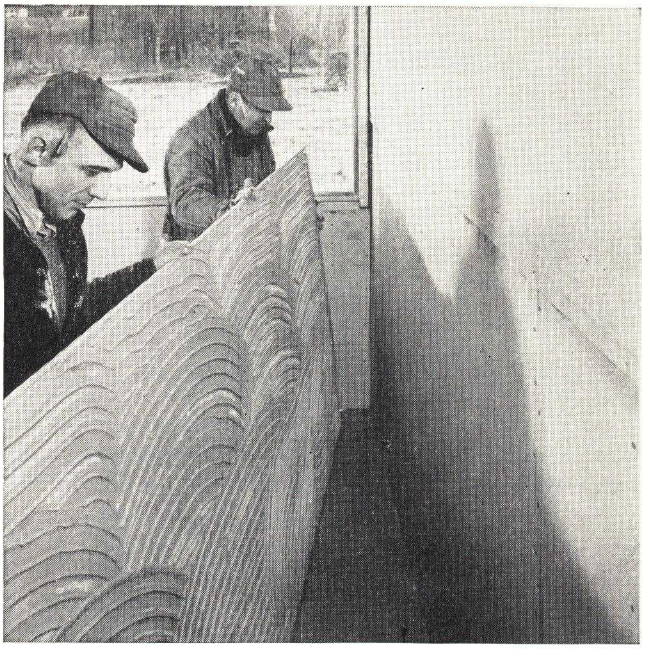
## FUNCTION AND UTILITY

A Double Wall of laminated SHEETROCK provides the following features in addition to the regular advantages of gypsum wallboard:

**Fireproof.** Two layers of SHEETROCK with its incombustible core provide a high degree of fire protection. See Technical Data for Fire Rating.

**Reduced Sound Transmission.** Quieter homes are assured by the greater mass of the Double Wall System.

**Strength.** Lamination of two thicknesses of gypsum board utilizes the maximum strength of the board and provides rugged walls to withstand stress and abuse.



Applying second layer of Sheetrock

**Crack-Resistance.** Joints between SHEETROCK panels are "welded" together by the PERF-A-TAPE Joint System to provide high resistance to cracks caused by frame movement, vibration, or settlement. Elimination of nails in the face layer of SHEETROCK greatly reduces transfer of stress to finished surfaces and minimizes possibility of nail "popping" or of nailhead area discoloration.

# SHEETROCK WALLBOARD ACCESSORIES

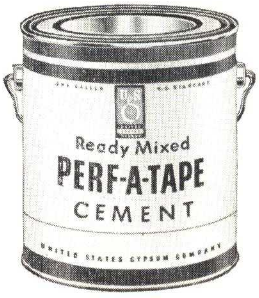
## PERF-A-TAPE Joint System

A system for reinforcing and concealing SHEETROCK wallboard joints, consisting of a special spark-perforated paper tape with chamfered edges, and an adhesive cement designed for maximum bond and workability. Joints reinforced and concealed by bonding the tape to the board with the cement are inconspicuous.

## READY-MIXED PERF-A-TAPE CEMENT

The ideal premixed adhesive for embedding PERF-A-TAPE reinforcement and for finishing and concealing joints and nail-heads in gypsum dry-wall installations.

Time and effort are saved as no mixing is required to produce a smooth cement with easy working qualities and excellent bond.



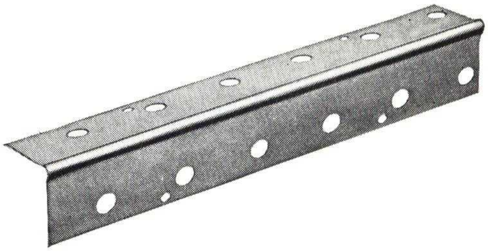
# SHEETROCK WALLBOARD ACCESSORIES

### DUR-A-BEAD Corner Reinforcement

A strong, easy-to-erect all metal corner reinforcement that provides an economical exterior corner for those applicators who prefer nail-on application.

PERF-A-TAPE Cement is used to fill and finish DUR-A-BEAD to produce true, impact-resistant exterior angles.

Lengths: 6′8″, 8′, 10′



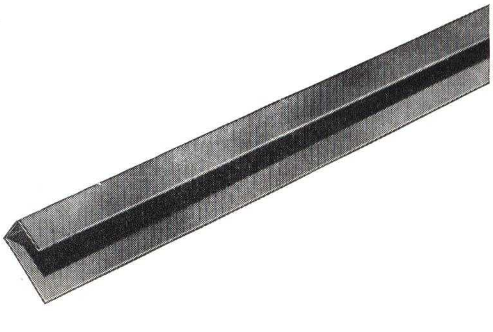
### PERF-A-BEAD Corner Reinforcement

A metal corner formed of electro-galvanized steel with PERF-A-TAPE wings, PERF-A-BEAD provides enduring metal protection for outside corners in gypsum wallboard construction. It eliminates wood corner moldings and provides a true corner that takes any decoration. It is applied with PERF-A-TAPE Cement, and can be used in new construction, remodel and alteration work, or in old work during redecoration. PERF-A-BEAD reinforces outside corner angles, uncased openings, pilasters, beams, ledges, and soffits.

### USG METAL TRIM

An electro-galvanized, smoothly finished steel channel for use as edge protection and trim around door and window openings, and as a molding at ceiling angles in single layer gypsum wallboard construction. Available either plain or painted to harmonize with predecorated wallboard, it is an economical utility trim which is especially suited for remodel work,—particularly when PANEL SHEETROCK is used.

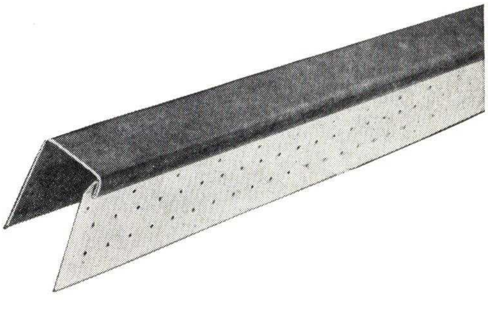
Size: ⅜″, ½″ and ¾″ thicknesses.



### PERF-A-TRIM

An electro-galvanized steel channel with PERF-A-TAPE flange attached, designed for use as a casing around door and window openings and at ceiling angles. Suitable for single layer or double-wall gypsum wallboard construction, PERF-A-TRIM is embedded with joint cement to produce a flush, inconspicuous edge reinforcement, and is bonderized for easy painting.

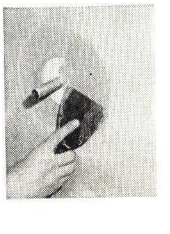
Size: ⅜″, ½″ and ¾″ thicknesses.



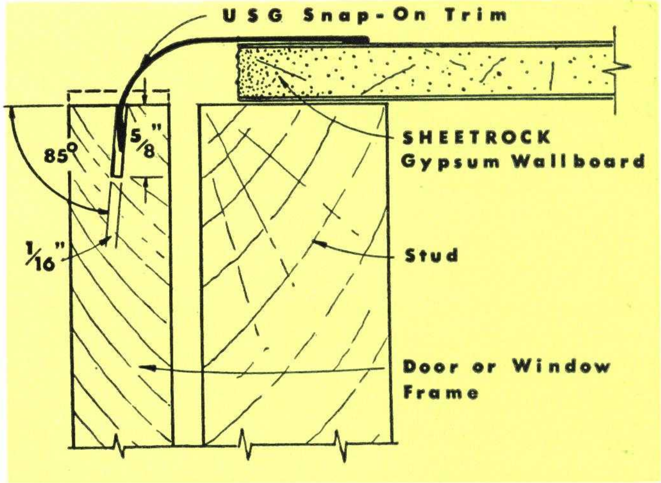
### PERF-A-TAPE Pipe Collars

Circular PERF-A-TAPE washers applied with PERF-A-TAPE cement and used to conceal and finish the ragged edges of holes made in gypsum wallboard for pipe outlets.

Size to fit ½″ and 1½″ inside diameter pipe.



# USG SNAP-ON TRIM



**For 5/8″ SHEETROCK Firecode 60—Increase width of frame 1/4″ for doors—1/8″ for windows, as shown by dotted line above.**

## DESCRIPTION

USG SNAP-ON TRIM is a metal moulding especially designed and formed to trim around door and window openings where wood jambs and wallboard surfaces are used. The use of this trim results in a graceful bullnose return as shown by the cross section drawing. Wood frames are kerfed by mill work supplier.

## SIZES:—

**Package A**—Consists of 12 pieces 7′ long with *right hand miter* one end, 12 pieces 7′ long with *left hand miter* one end and 12 headpieces 3′-6″ with square ends.

**Package B**—Consists of 30 pieces 10′ long mitered both ends.

**Special Sizes**—Special lengths available upon inquiry.

## FUNCTION AND UTILITY

**Economical**—Reduces labor costs up to 50%—Material delivered to job with side sections coped—Make only rough cuts on job—Skilled finishing labor not required—Members quickly applied—They snap in place.

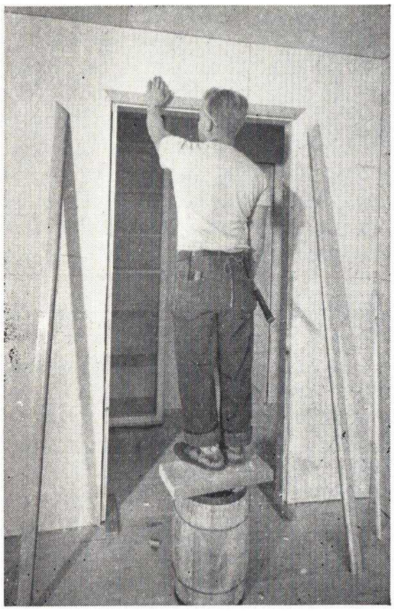
**Durable**—Metal nose resists abuse.

**Tight Fitting**—No gap between metal trim and wood frame—Spring action assures contact with wallboard surface—Projects less than 3/32″ from surface, eliminating heavy dust-catching ledges over doors.

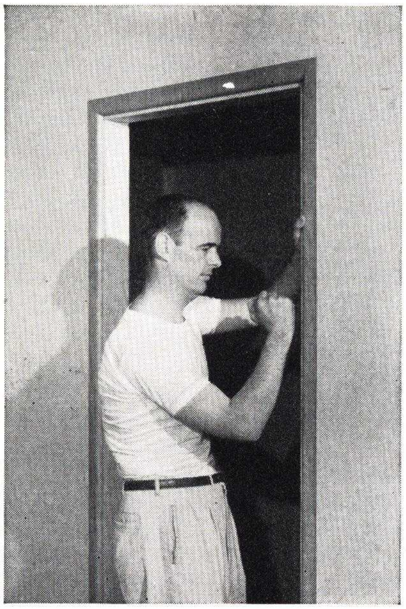
**Simplifies Wallboard Application**—Trim fits over wallboard after wallboard is installed—No openings to work away from or trim to work to.

**Bonderized Finish**—The metal trim is bonderized to protect against rusting and to provide suitable base for paints.

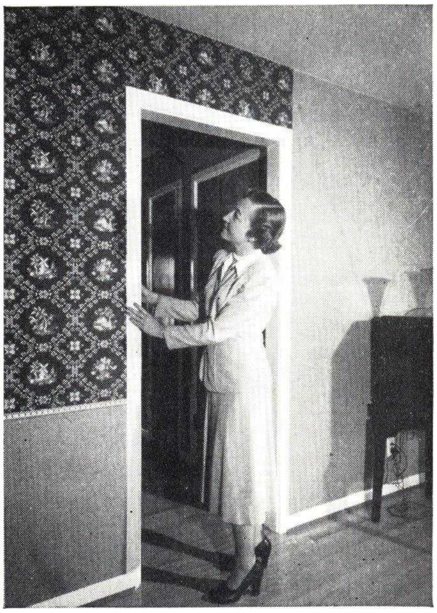
**No Nails Required**—Positive locking spring action holds trim permanently—No finish nail holes to putty.



**Header rough cut to size on job and snapped in place. Side pieces are mill coped, merely cut to length on job and install.**



**Side pieces of trim are easily and permanently installed by sharp blows of the palm of the hand.**



**The finished door opening after trim and walls are decorated outlines the neat and modern styling of the rounded corners.**

# SHEETROCK WALLBOARD TECHNICAL DATA

## FIRE RESISTANCE RATINGS FOR SHEETROCK WALLBOARD

**(Tests conducted in recognized laboratories according to ASTM Specifications.)**
**(Copies available on Request)**

| FACING | RATING | REFERENCE |
|---|---|---|
| **PARTITIONS (a)** | | |
| ⅜″ SHEETROCK | 25 Minutes | (1) |
| ½″ SHEETROCK | 40 Minutes | (1) |
| ½″ SHEETROCK, mineral wool batts nailed to studs. | 1 Hour | (1) |
| ½″ SHEETROCK, loose mineral wool fill. Non-Bearing. | 1 Hour | (1) |
| ½″ SHEETROCK Firecode 45 | 45 Minutes | (2) |
| ⅝″ SHEETROCK Firecode 60 | 1 Hour | (2) |
| 2 layers ⅜″ SHEETROCK | 1 Hour | (3) |
| 2 layers ½″ SHEETROCK Non-Bearing | 1½ Hours | (4) |
| 2 layers ⅝″ SHEETROCK Firecode 60 | 2 Hours | (2) |
| **CEILINGS (b)** | | |
| ½″ SHEETROCK<br>(Nailed to joists with 1¾″, No. 12 ga. nails, having ½″ heads.) | 25 Minutes | (1) |
| ½″ SHEETROCK Firecode 45 | 45 Minutes | (2) |
| ⅝″ SHEETROCK Firecode 60 | 1 Hour | (2) |
| 2 layers ⅜″ SHEETROCK | 30 Minutes | (1) |
| 2 layers ½″ SHEETROCK | 1 Hour | (5) |
| **COLUMNS (c)** | | |
| 4 layers ½″ SHEETROCK | 2½ Hours | (6) |
| 3 layers ½″ SHEETROCK | 1½ Hours | (7) |
| 2 layers ½″ SHEETROCK | 1 Hour | (8) |

a. Wood studs faced both sides as indicated. Ratings apply on both Bearing and Non-Bearing partitions, except as shown.

b. Wood joists faced with rough and finish floor, and on the under side as indicated.

c. Steel Columns.

1. National Bureau of Standards Published B.M.S. 92, tables 30 and 42.

2. Underwriters' Laboratories, Inc.

3. Nationally recognized Fire Testing Laboratory—name and special details on request.

4. National Bureau of Standards Reference No. FP 2708, not published. (Construction: First layer applied vertically with 5d, 13½ ga., 1⅝″ long, 7/32″ diam. head, cement-coated nails spaced 6″ to 8″ o.c. Finish layer applied horizontally with 8d, 11½ ga. 2⅜″ long, ¼″ diam. head, cement-coated nails spaced 6″ to 8″ o.c. Joints reinforced with PERF-A-TAPE Joint System.)

5. National Bureau of Standards Reference No. FP 2926, not published. (Construction: Two layers applied horizontally, separated by 20 ga. 1″ hexagonal mesh wire fabric. Joints on finish layer reinforced with PERF-A-TAPE Joint System. Nails: First layer—5d, 15 ga., 1⅝″ long, 7/32″ diam. head, cement-coated nails spaced 18″ o.c. Fabric and finish layer—8d, 12½ ga., 2⅜″ long, ¼″ diam. head, cement-coated nails spaced 5″ to 7″ o.c.)

6. National Bureau of Standards Test No. 315, May 22, 1952 (Construction: 4 layers cut in widths to span the flanges or re-entrant spaces and to bear on the edges of the flanges and of the other layers of board; cut in length to cover the column height. Each layer applied vertically with joint cement to bond the inner layer to the column and successive layers to each other. Wire tied around the column with double strands of 18 ga. tie wire spaced 15″ apart after third layer in place. Face layer held in place with wooden forms until cement hardened. Corners finished with PERF-A-TAPE Joint System.)

7. National Bureau of Standards Test No. 304, May 25, 1951 (Construction: 3 layers cut and applied as in Test No. 315, except board was cemented and clinch-nailed together in pairs before application to form inner layers. Tied around column with double strands of 18 ga. tie wire spaced 15″ apart before application of third layer. Corners finished with PERF-A-TAPE Joint System.)

8. National Bureau of Standards Test No. 303, May 23, 1951 (Construction: 2 layers cut and applied as in Test No. 315, except inner layer tied around column with double strands of 18 ga. tie wire, spaced 15″ apart. Corners of face layer finished with PERF-A-TAPE Joint System.)

# SHEETROCK WALLBOARD TECHNICAL DATA

## SHEETROCK BENDING RADII

| THICKNESS | LENGTHWISE | WIDTH |
|---|---|---|
| ½″ | 20′** | .. |
| ⅜″ | 7½′ | 25′ |
| ¼″ | 5′ | 15′ |

**Bending two ¼″ pieces successively permits radii shown for ¼″ SHEETROCK.

Notes:

1. To apply board, place a stop at one end of the curve and then gently and gradually push on the other end of the board, forcing the center against the framing until the curve is complete.

2. By moistening the face and back paper thoroughly and allowing the water to soak well into the core, the board may be bent to still shorter radii. When the board dries thoroughly, it will regain its original hardness.

## THERMAL RESISTANCE (R) OF INSULATING SHEETROCK FACING AN AIR SPACE OF ¾″ OR MORE

**All figures based on 1953 Guide of the ASHVE**

| DIRECTION OF HEAT FLOW | Thickness of Insulating Sheetrock<br>½ inch | ⅜ inch | ¼ inch |
|---|---|---|---|
| **DOWNWARD**<br>Use these coefficients for ceilings and sloping surfaces under summer conditions | 6.86 | 6.78 | 6.69 |
| **UPWARD**<br>Use these coefficients for ceilings and sloping surfaces under winter conditions | 2.52 | 2.44 | 2.35 |
| **HORIZONTAL**<br>Use these coefficients for walls under both summer and winter conditions | 2.52 | 2.44 | 2.35 |

## EFFECT OF VAPOR BARRIERS ON CONDENSATION

Atmospheric air always contains moisture in the form of an invisible gas, water vapor. Like all gases, this water vapor exerts pressure, the greater quantity of it present in the air at a given temperature, the higher the pressure. Consequently, just as water at a higher level will flow to a lower point unless a barrier is interposed, so water vapor at a higher pressure will flow to an area of lower pressure unless a suitable barrier intervenes.

In the typical example shown, the high moisture content within the room exerts a higher vapor pressure than exists outside, and therefore the water vapor flows towards the outside, progressively meeting colder and colder temperatures. As the temperature decreases, the air can hold less and less water vapor without becoming saturated with it. So, at a point near the back of the sheathing in both walls, temperatures are reached where the air can no longer hold the water vapor moving into it, and the excess water vapor condenses out within the constructions. However, the rate of vapor flow toward the outside in the "Conventional Wall" is about 20 times as great as it is in the "Vapor Barrier Wall." because the vapor permeability of the SHEETROCK in the former is about 20 times that of the SHEETROCK and foil in the "Vapor Barrier Wall." As a result, the condensation in the "Conventional Wall" is about 2 gallons per one thousand square feet of wall per day, whereas only about ⅔ pint condenses out in the same area of "Vapor Barrier Wall."

When the atmospheric conditions indicated are of considerable duration, the amount of condensation in the "Conventional Wall" is sufficient to damage the interior decoration, exterior paint, or any of the other wall components. In the "Vapor Barrier Wall," however, the quantity of condensate is so minor as to be readily dissipated.

### Recommendations

1. An efficient vapor barrier should be installed in all exterior walls and ceilings in locations where below freezing weather occurs for extended periods of time.

2. Vapor barrier should be on the warm side of the wall.

3. Vapor barrier should have a vapor permeability of not more than 1.00 Perm.†

4. Aluminum foil is one of the most efficient vapor barriers known and used commercially. When applied at our factory to the back of SHEETROCK gypsum wallboard, the resultant product is known as Insulating SHEETROCK wallboard. Permeabilities to vapor transmission of this and other materials are:

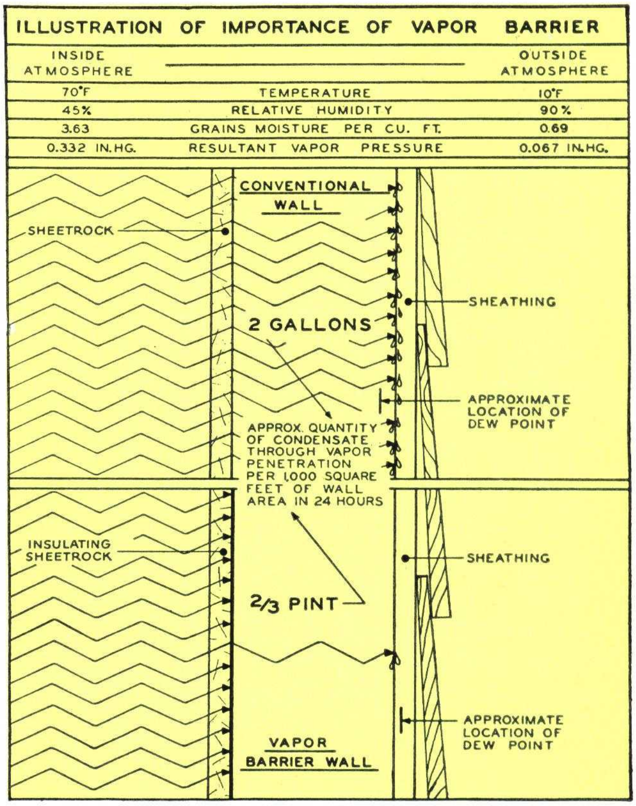


ILLUSTRATION OF IMPORTANCE OF VAPOR BARRIER

| INSIDE ATMOSPHERE | | OUTSIDE ATMOSPHERE |
|---|---|---|
| 70°F | TEMPERATURE | 10°F |
| 45% | RELATIVE HUMIDITY | 90% |
| 3.63 | GRAINS MOISTURE PER CU. FT. | 0.69 |
| 0.332 IN.HG. | RESULTANT VAPOR PRESSURE | 0.067 IN.HG. |

CONVENTIONAL WALL
SHEETROCK
SHEATHING
2 GALLONS
APPROXIMATE LOCATION OF DEW POINT
APPROX. QUANTITY OF CONDENSATE THROUGH VAPOR PENETRATION PER 1,000 SQUARE FEET OF WALL AREA IN 24 HOURS
INSULATING SHEETROCK
SHEATHING
2/3 PINT
APPROXIMATE LOCATION OF DEW POINT
VAPOR BARRIER WALL

| **Material** | Perms.† |
|---|---|
| Insulating SHEETROCK Wallboard | 0.085 to 0.385 |
| Duplex Papers | 0.515 to 2.56 |
| Insulation Back-up Paper | 0.860 to 3.40 |
| Fir Sheathing | 2.94 |
| ½″ Plywood | 2.66 to 3.35 |
| Paint Film | 3.43 |
| Plaster with 3 coats enamel paint | 3.68 to 3.84 |
| Pine lap siding | 4.90 |
| Slaters Felt | 5.15 to 49.1 |
| Plaster on wood fiber board or plain gypsum lath | 19.7 to 20.5 |
| Fiber board sheathing—not surface coated | 25.7 to 34.2 |
| Fiber board sheathing—surface coated type | 3.03 to 4.36 |

For other permeability ratings see BMS-63—Bureau of Standards.

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† 1 Perm = 1 grain per sq. ft. per hour per inch of mercury vapor Pressure difference.

# APPLICATION OF SHEETROCK WALLBOARD

## NAIL SPECIFICATIONS FOR SHEETROCK

| TYPE OF NAIL* | DESCRIPTION | RECOMMENDED USE | Lbs. per M Ft. |
|---|---|---|---|
| **4D** COOLER TYPE NAIL | 7/32″ flat head 14 gauge 488 per lb. | ⅜″ or ¼″ SHEETROCK applied direct to Framework. | 4½ |
| **5D** COOLER TYPE NAIL | 15/64″ flat head 13½ gauge 364 per lb. | ½″ SHEETROCK<br>½″ SHEETROCK FIRECODE 45 | 6 |
| **6D** COOLER TYPE NAIL | ¼″ flat head 13 gauge 275 per lb. | ⅝″ SHEETROCK FIRECODE 60<br>¼″ SHEETROCK over existing surface. | 7 |
| **4D** PREDECORATED NAIL | 3 colors: Knotty Pine, Bleached Mahogany, Walnut. 488 per lb. Order from U. S. Gypsum Co. or contact Independent Nail and Packing Co., Bridgewater, Mass. | Woodgrained SHEETROCK | 4½ |

*When setting types of nail "spotting" materials are used, nails must be cement coated.

### SINGLE LAYER APPLICATION

SHEETROCK is usually applied directly over wood framing members, applying ceilings first, then walls. Boards should be accurately cut to fit and joints loosely butted, not forced into place. End joints should be staggered. Insulating SHEETROCK is applied with the foil side against the framing.

The application of SHEETROCK over ¾″ wood furring strips applied across studs or joists is not recommended, since the comparative flexibility of the furring under the impact of the hammer tends to loosen nails already driven. SHEETROCK may be applied on furring strips installed over a solid backing, such as an existing wall surface.

Nails should be spaced 5″ to 7″ apart on ceilings, and 6″ to 8″ apart on walls; nailing should progress from the center of the board towards edges and ends. During nailing, the board should be pressed firmly against the framing.

SHEETROCK wallboard may be applied either vertically, with long edges parallel to framing members, or horizontally, with long edges at right angles to framing. Horizontal application is the method generally recommended for walls over 4′ wide and under 8′0″ high.

**Advantages of Horizontal Application:**

1. Reduces necessary joint treatment footage up to 25 per cent.
2. Strongest dimension of board runs across framing members.
3. Bridges irregularities in alignment and spacing of framing members.
4. Eliminates need for headers.
5. Better bracing continuity—each board ties more framing members together.
6. Joints on walls are at a convenient height for the finishing operation.

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### DOUBLE WALL APPLICATION

In applying the Double Wall System, a base layer of ⅜″ BAXBORD is applied at right angles to the studs and joists, with end joints staggered and positioned between framing members. A face layer of ⅜″ SHEETROCK is adhesively applied over the BAXBORD, with PERF-A-TAPE Cement, and temporarily secured by nailing. Joints between the two layers must be offset at least 10″. After the adhesive hardens, nails are countersunk through the face layer with a nail set, nail holes are filled, and joints in the face layer are reinforced and concealed with the PERF-A-TAPE Joint System.

**Double Wall Nail Data**

| | |
|---|---|
| Type required | 4d cooler type |
| Spacing-first layer ceilings | 6″ o.c. |
| Spacing-first layer walls | 8″ o.c. |
| Spacing-face layer ceilings (temp) | 12″ o.c. |
| Spacing-face layer walls (temp) | 16″-24″ o.c. |

***Note: Where one hour Fire Resistance Ratings are required, refer to applicable notes following fire resistance rating table on page 7.***

# APPLICATION OF SHEETROCK WALLBOARD

## DOUBLE WALL APPLICATION—Cont.

In order to minimize the footage of joints to be treated, and to obtain the best overall results, the application of the finish layer of SHEETROCK is varied to fit the size of the area to be covered, as follows:

### Ceilings

**1. Ceilings less than 12′ in either dimension.** Full-length SHEETROCK wallboard is used to span ceiling from wall to wall.

**2. Ceilings longer than 12′, less than 12′ wide.** Full length SHEETROCK is used to span the width of the room. If the joists are parallel to the width of the room, long edges of SHEETROCK shall be centered on and temporarily nailed through to the joists.

**3. Ceilings with both dimensions greater than 12′.** Face layer of 4′ wide SHEETROCK may be applied either parallel to or at right angles to the framing. In parallel application, long edges shall be centered over and temporarily nailed through to the joists.

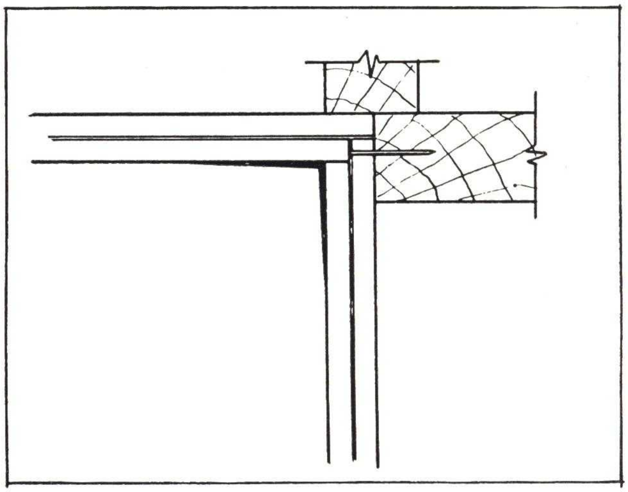
### Walls

**1. Walls not more than 8′3″ in height.** Face layer SHEETROCK is applied horizontally (across the studs) with joints offset at least 10″ in relation to BAXBORD. This permits two widths of board to span the wall from floor to ceiling. Where ceiling height is between 8′ and 8′3″, the 1″ to 3″ gap is left at the floor, to be filled with scrap strips and concealed by the baseboard. Twelve-foot panels are used wherever possible to minimize end joints. Where wall lengths exceed 12′, vertical end joints are staggered.

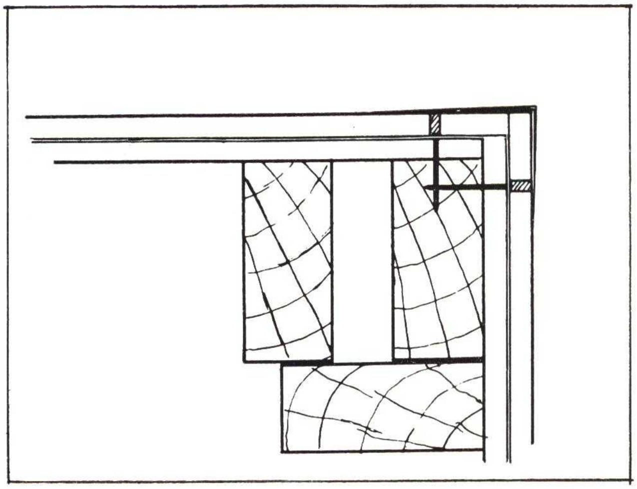
**2. Walls greater than 8′3″ in height.** Where walls exceed 8′3″ in height, the face layer is then applied vertically, with full-length SHEETROCK extending from floor to ceiling and eliminating end joints. Long edges must be centered over and temporarily nailed to studs.

### Corners

**Inside corners.** In applying the two layers of SHEETROCK wallboard into inside corners, only the overlapping board of the first layer is nailed to the corner support. This secures both boards into corner. Face layer SHEETROCK is not nailed to corner framing member. A floating-type corner results when face layer corner is reinforced with PERF-A-TAPE.



**Outside corners.** First layer board is not nailed to corner framing on outside corners. Only face layer board is nailed to corner support, and these nails are countersunk after the adhesive has set. The corner is then reinforced with PERF-A-BEAD.



# DECORATION OF SHEETROCK WALLBOARD

## PREPARATION AND APPLICATION

SHEETROCK walls, like those of any other material, must be properly prepared for decoration. The following general suggestions will help to ensure best results.

### Wallpaper and Wall Fabric Finishes.

SHEETROCK Sealer, or one coat of high-gloss varnish cut 25% with turpentine, properly prepares SHEETROCK wallboard for wallpapering, and should always be used. Unless a suitable size is applied prior to papering, an undue softening of the face paper of SHEETROCK may result when old wallpaper is soaked or steamed from walls and ceilings before re-papering.

### Painted Finishes.

The use of joint treatments in dry-wall construction introduces painting problems which must be recognized. The surface texture of the wallboard and its paint absorbing characteristics (suction) differ from that of the surfaces finished with joint cement. If not properly primed, the smoother, high-suction surfaces of the joint cement may show up either as highlight areas or as "shadow" appearances under many paint finishes. For this reason, SHEETROCK wallboard surfaces must be properly prepared for painting. SHEETROCK Sealer, or any other good quality gypsum wallboard sealer, will accomplish this purpose.

Refer to U S G Technical Literature on TEXOLITE* Paint Products, AIA File Number 25-B, for detailed painting specifications.

## SHEETROCK as a Base for Ceramic or Other Tile (Adhesive Application)

If the SHEETROCK Wallboard is adequately protected from water by the tile and adhesives, there should be no difficulty. As a general rule, the following precautions will help prevent failures:

1. Cut edges of SHEETROCK should not be used at the intersection of wall and tub. Paper-bound edges should come at this point, and two coats of varnish should be applied to the bottom edge of the SHEETROCK and should be carried up at least 4″.

2. Two coats of varnish should be applied to the core and paper at cut-outs for shower head, pipe and valve adjustments.

3. If tile is used, it should be installed by a reputable contractor using first class materials.

4. The tile should be carried at least 6″ above the shower head.

5. If the use of varnish does not conflict with the tile application specifications, the entire face of the board to be tiled should receive two coats of varnish.

6. The space between the SHEETROCK and tub should be filled with a non-setting type of caulking prior to the tile application. To facilitate this, the bottom edge of the SHEETROCK should be set about ¼″ above the lip of the tub. Upon completion of tile installation, the space between tub and tile should be grouted similar to the balance of the installation.

7. Ceramic tiles should not be applied over ⅜″ SHEETROCK attached only to studs 16″ o.c., but should be further supported by attachment to headers placed between studs a few inches above tub line and at dado cap or mid-ceiling height. The use of ½″ SHEETROCK on 16″ o.c. framing does not require such added support. Use standard nails and nailing.

An application of other waterproofing agents can be substituted for varnish provided it is compatible with the mastic used to secure the tile and with the SHEETROCK. Water-proofing mastics can be similarly employed.

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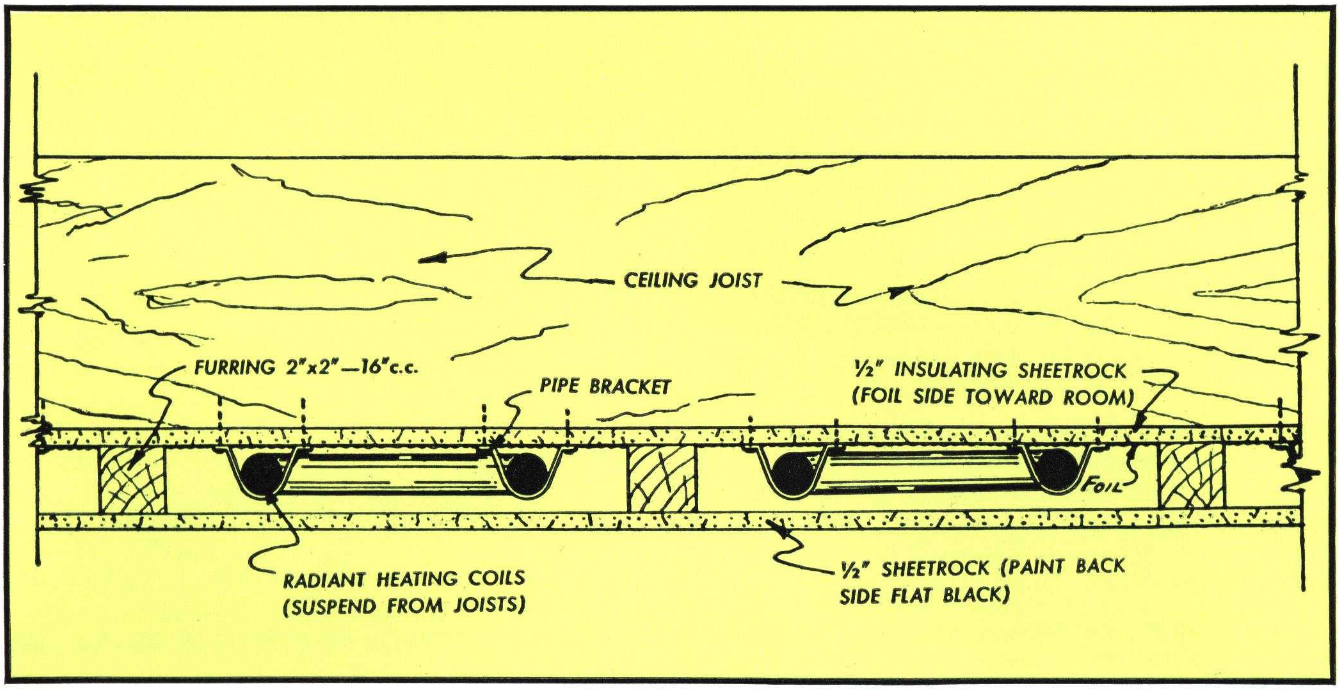
**Trademark Reg. U.S. Pat. Off.*

# USE OF SHEETROCK IN RADIANT HEATED CEILINGS


CEILING JOIST
FURRING 2"x2"—16"c.c.
PIPE BRACKET
½" INSULATING SHEETROCK (FOIL SIDE TOWARD ROOM)
FOIL
RADIANT HEATING COILS (SUSPEND FROM JOISTS)
½" SHEETROCK (PAINT BACK SIDE FLAT BLACK)

During recent years the use of radiant heating systems has become more prevalent in building construction. When SHEETROCK wallboard is to be used on ceilings having radiant heating, the following recommendations will help to ensure best results:

**DESIGN**

1. In radiant heating systems where SHEETROCK wallboard is used, the maximum surface temperature of the SHEETROCK must not exceed 115° F.

**APPLICATION**

1. Apply Insulating SHEETROCK parallel to the joists with the aluminum foil facing downward, as a reflector behind the heating coils.

2. Nail 2″ x 2″ furring strips 16″ o. c. over the Insulating SHEETROCK and at right angles to the joists. Wood must be dry and thoroughly seasoned to avoid movement of green lumber in the heated space.

3. Suspend heating coils from the joists, at right angles to them and never from the SHEETROCK alone.

4. Use only that thickness of SHEETROCK on which the Heating Engineer has based his design. For example, do not substitute ⅜″ SHEETROCK for the face layer when the design calls for and is based on ½″ SHEETROCK.

5. Apply a coat of flat black paint on the back of the face layer of regular SHEETROCK, to increase the efficiency of the system. Apply the face layer in the normal manner, at right angles to the furring strips.

6. Do not operate radiant heating system until after taping and finishing of ceiling joints is completed, and cement has thoroughly dried.

# SPECIFICATIONS FOR SHEETROCK WALLBOARD

## GENERAL PROVISIONS

In cold weather the building shall be heated well in advance of and during the application of the gypsum wallboard, to maintain a uniform temperature in the range of 55° to 70°F., and ventilation shall be provided to eliminate excessive moisture.

## SCOPE

Furnish all labor, material, and equipment necessary to finish all interior walls and ceilings with gypsum wallboard in accordance with the specifications and drawings.

Finish walls and ceilings in (specify rooms or areas) with 3/8″ Tapered Edge SHEETROCK Wallboard, laminated on the job over a base layer of 3/8″ BAXBORD in accordance with the U. S. Gypsum Co. Double Wall System. Use of this system is optional in closets, except for those walls dividing occupancies.

Finish walls and ceilings in (specify rooms or areas) with Panel SHEETROCK (specify type) applied over a base layer of 3/8″ regular SHEETROCK.

Finish walls and ceilings in (specify rooms or areas) with a single layer of (specify: 1/2″ Tapered Edge SHEETROCK, Firecode 60 or 45, Woodgrained SHEETROCK (type) or other desired material.)

Finish all exterior walls and top floor ceilings with Insulating SHEETROCK (aluminum foil backed).

Where Tapered Edge SHEETROCK is specified, finish all joints and internal angles with the PERF-A-TAPE Joint System, and reinforce and finish all external angles with PERF-A-BEAD (or DUR-A-BEAD).

At all openings, protect and finish the edges of SHEETROCK with (size) USG Metal Trim (or USG SNAP-ON Trim) (or PERF-A-TRIM).

## MATERIALS

### General.

All materials shall be the products of the United States Gypsum Company, delivered to the job in original unopened containers or bundles, stored in a place protected from exposure to the elements and from damage by tampering, and used in strict accordance with manufacturer's directions.

### Gypsum Wallboard:

1/2″ (3/8″) Tapered Edge SHEETROCK
5/8″ (1/2″) SHEETROCK Firecode 60 (45)
1/2″ (3/8″) Insulating SHEETROCK
3/8″ Woodgrained SHEETROCK (specify finish)
3/8″ Panel SHEETROCK (specify finish)
3/8″ BAXBORD

### Joint Treatment and Laminating Adhesive:

PERF-A-TAPE Joint System; PERF-A-TAPE Cement.

### Corner Reinforcement:

PERF-A-BEAD or DUR-A-BEAD

### Metal Trim:

USG Metal Trim (PERF-A-TRIM) (or USG SNAP-ON Trim) (specify size).

### Nails:

For 5/8″ SHEETROCK Firecode 60: 6d cooler type, 13 ga., 1/4″ diam. flat-head.

For 1/2″ SHEETROCK: 5d cooler type, 13 1/2 ga., 15/64″ diam. flat-head.

For 3/8″ SHEETROCK: 4d cooler type, 14 ga., 7/32″ diam. flat-head.

For Woodgrained SHEETROCK; 4d Predecorated, to blend with color of board.

## FRAMING

The contractor shall check the alignment of framing members and make necessary adjustments before proceeding with application of wallboard. Framing for 3/8″ board shall be spaced not over 16″ o.c., for 1/2″ board, 16″ to 24″, for Firecode board, 16″ where fire rating is required. Framing members shall be straight and in alignment, and headers provided for solid support for cabinet and fixture attachment as indicated and wherever necessary.

## APPLICATION

### Single Layer.

Cut and fit SHEETROCK wallboard accurately, and apply to ceilings first, then to walls, in the longest lengths possible, with long edges at right angles to framing members. Support all ends on framing members, and stagger end joints. Joints on opposite sides of partitions shall not fall on the same stud. Butt all joints together loosely, and sand cut edges to provide smooth joining.

On areas less than 4′ wide, on walls over 8′3″ high, and on all areas where Woodgrained SHEETROCK is specified, apply board with long edges parallel to framing members. Provide headers as necessary to furnish support for all joints in Woodgrained installations.

**APPLICATION—Single Layer—Cont.**

Apply Insulating SHEETROCK with the foil surface against the framing, being careful not to damage the foil unnecessarily.

Securely nail wallboard to supports, spacing nails not less than ⅜″ nor more than ⅝″ from edges and ends of board, and 5″ to 7″ apart on ceilings, 6″ to 8″ apart on walls. Nails shall be "driven home" with heads dimpled slightly below the surface of the board without breaking the face paper. Use a padded or plastic-headed hammer to drive predecorated nails.

*Note:* (When single layer wallboard application will occur during seasons when high humidities and slow drying conditions prevail, the following may be included to ensure best results.)

Reinforce all ceiling joints with strips of SHEETROCK centered over the back of the joint in the joist spaces, and cemented in place with PERF-A-TAPE Cement applied with a notched spreader blade. Strips shall be 8″ to 10″ wide and approximately as long as space between joists, and shall be installed as the wallboard is being erected, or, where attic spaces permit, from above after erection. Reinforce end joints by cementing strips on each side of joist on which joint occurs, as close as possible to the joist. Do not begin joint finishing for at least 12 hours after installation of these reinforcing strips.

### Double Layer.

Apply base layer of ⅜″ BAXBORD with long edges at right angles to supports, using longest lengths possible and loosely butting all joints. End joints shall occur between framing members, and shall be staggered. Securely nail in place with 4d nails spaced 8″ o.c. on walls, and 6″ o.c. on ceilings, 4 and 5 nails respectively per board per support.

Face layer shall be ⅜″ Tapered Edge SHEETROCK wallboard of sufficient length, up to 12′, to span wall and ceiling areas from corner to corner. All joints shall be loosely butted together, and joints in first and face layers (other than in corners and at ceiling angles) shall not underlie each other, but shall be offset at least 10″.

Cut face layer to size and spread adhesive (PERF-A-TAPE Cement) over back surface with a notched Spreader Blade, being careful to keep adhesive off edges and face of board. Place face layer in position on wall or ceiling, and temporarily hold in place, to ensure bond between the layers, with nails spaced 12″ o.c. on ceilings and 16″ to 24″ o.c. on walls, in the field and on the edges of the board. After 24 hours countersink nails through face layer and fill holes with SHEETROCK Filler.

### Joint Treatment.

Mix PERF-A-TAPE Cement according to manufacturer's directions and butter joints and internal angles with a sufficient thickness to hide board surface completely. Center PERF-A-TAPE on the joint or angle and squeeze out excess cement with broadknife or other suitable tool, leaving enough cement under tape for proper bond. Cover tape with full layer of cement and let dry.

When first coat is thoroughly dry, apply second coat evenly over the entire joint, feathered out beyond edges of first coat.

When second coat is thoroughly dry apply third and finish coat, mixed to thinner consistency and applied as a film. Feather out beyond edges of second coat and even up all surfaces of the joint.

Sand lightly as necessary to remove rough projections and ensure a smooth inconspicuous joint. Spot all nail-head depressions as each coat is applied.

### Corner Reinforcement.

Apply PERF-A-BEAD (or DUR-A-BEAD) in strict accordance with manufacturer's directions.

### Cased Opening.

Apply USG METAL TRIM (PERF-A-TRIM) (or USG SNAP-ON TRIM) in strict accordance with manufacturer's directions.

### Panel SHEETROCK

Apply base layer of ⅜″ BAXBORD horizontally (long edges at right angles to framing) with end joints staggered on supports. Spread adhesive on the back of panel with USG Adhesive Spreader, being careful to keep adhesive off edges and face of panel. Place first panel in vertical position on wall and plumb with carpenter's level. Secure in place until adhesive hardens with one nail top and bottom, placed so as to be covered by molding and baseboard. If USG METAL TRIM is used at wall and ceiling angle, top nail is unnecessary.

Install successive panels in similar fashion, bringing edges into firm contact, if necessary by impacting against the leading edge of panel with 2″ x 4″ about 12″ shorter than the panel. Fit all corners neatly, and where plain Panel SHEETROCK is used reinforce outside corners with PERF-A-BEAD. Finish outside corners of predecorated Panel SHEETROCK with wood molding.

UNITED
STATES
GYPSUM

AIA FILE NUMBER 23-L

TECHNICAL INFORMATION

# USG* INSULATION

## DECORATIVE TYPE

**UNITED STATES GYPSUM**
**The Greatest Name in Building**

GENERAL OFFICES—300 WEST ADAMS STREET, CHICAGO 6, ILLINOIS

1955

*T. M. Reg. U. S. Pat. Off.

AIA FILE NUMBER 23-L

# USG* DECORATIVE INSULATION

## DESCRIPTION

USG Decorative Insulation is rigid wood fiber insulating board made into predecorated interior wall and ceiling units. The products are fabricated from homogeneous mats manufactured of wood fiber produced from new timber.

There are two basic types of USG Decorative Insulation:

1. USG Insulating Twin-Tile and Panel-Tile—Square and rectangular patterns generally used for ceiling paneling.
2. USG Insulating Plank—Long, narrow, ceiling height units simulating vertical random wall planking.

For sizes, edges, etc., see data on page 4.

*Colors:*

"Hilite," a light ivory solid color.
"BLENDTEX"* insulation board, a blend of four tan tones.

## FUNCTION AND UTILITY

**Decorative**—Many designs and patterns are possible with combinations of random width plank and various sizes of tile—using either Hilite or BLENDTEX or both.

**Insulating**—The ½″ thickness, with a thermal conductance of 0.66, is equal to approximately 19″ of stone concrete in resistance to heat transfer.

**Light Reflective**—Hilite color has a light reflection of 70 to 80 per cent. Light reflection of BLENDTEX is high, but variable, due to blending of four colors.

**Tongued and Grooved**—The new Kwik-Lok joint featured on Twin-Tile, Panel-Tile, and Plank is designed specially for application utilizing the automatic stapling machine or tacker, unquestionably the easiest, fastest, and most economical method of applying tile or plank. This wide flange tongue and groove edge interlocks securely preventing harmful discoloration caused by joint "breathing" and assures better alignment of units for true and level ceilings.

**Economical**—Sizes 12″ x 24″ and 16″ x 32″, ½″ and ¾″ Twin-Tile are center-scored to exactly simulate 12″ x 12″ and 16″ x 16″ patterns. This "two-in-one" feature reduces application costs on square patterns by at least 40%—twice the area is covered with one piece in a single operation. Panel-Tile unit sizes are the same as Twin-Tile but without the center scoring. This produces a rectangular instead of a square pattern. The stapling method of application offers a saving up to 50%.

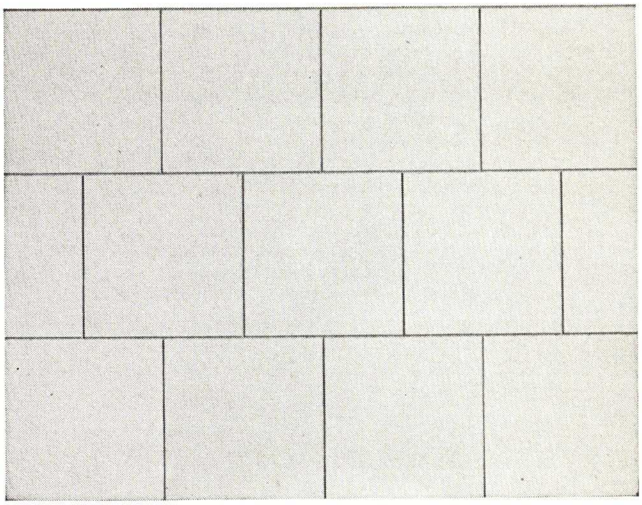
**Easy Application**—USG Tile and Plank may be stapled or nailed to conventional wood supports or may be applied to solid surfaces with adhesives. Practically any type of interior wall or ceiling may be finished with these materials.

**Three-Quarter-Inch Twin-Tile and Panel-Tile**—with a thermal conductivity of 0.44 provides added insulation, greater strength and rigidity, more sound absorption, less sound transmission.

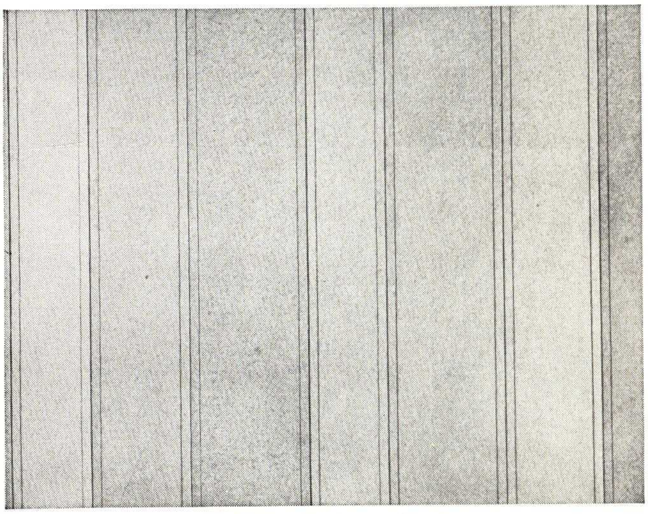
**Easily Maintained**—Ordinary surface dust may be removed by using wallpaper cleaner. Redecorating may be done with good lead and oil or water-thinned emulsion paints; TEXOLITE* is recommended.

## LIMITATIONS OF USE

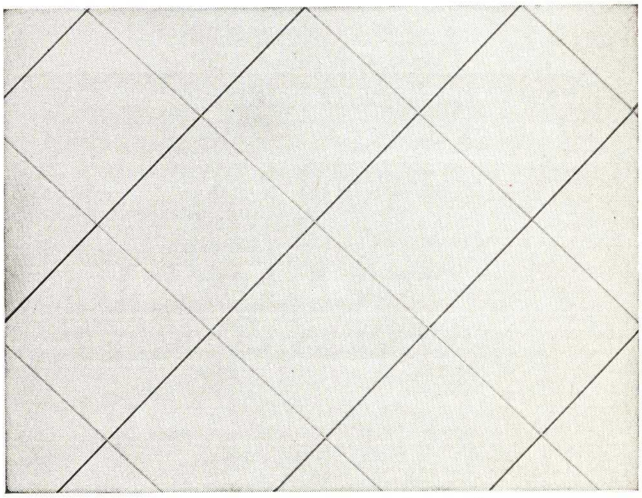
1. Supports must be spaced not to exceed 16″.
2. Where adhesive method of application is used, the adhesive must be prepared and used in strict accordance with manufacturer's directions.



Insulating Twin-Tile



BLENDTEX Insulating Plank



Insulating Twin-Tile placed diagonally

**"USG", "BLENDTEX", "RED TOP", "SHEETROCK", "ROCKLATH" and "TEXOLITE", mentioned in this publication are registered trademarks owned by United States Gypsum Company and are used by it to distinguish its products.**

**"USG" identifies the particular fiber insulation board; "BLENDTEX" identifies the particular fiber insulation board in variegated shades; "SHEETROCK" identifies the particular gypsum wallboard; "ROCKLATH" identifies the particular gypsum plaster base; "TEXOLITE" identifies the particular casein flat paint manufactured only by United States Gypsum Company; "RED TOP" identifies the particular mineral wool sold only by United States Gypsum Company.**

**Trademarks Reg. U. S. Pat. Off.*

# USG DECORATIVE INSULATION

## SPECIFICATIONS

**SCOPE:** Unless otherwise shown on plans, all decorative insulation shall be furnished and installed according to these specifications. ***(Note to Architect: If different colors and sizes are required for various areas, list and locate all wall and ceiling areas to be covered.)***

## USG INSULATING ½″ PANEL-TILE AND TWIN-TILE

### MATERIALS

Insulating tile shall be (*specify size*) ½″ USG Insulating Panel-Tile or Twin-Tile (Hilite) (BLENDTEX), manufactured by United States Gypsum Company.

Stapling machine shall be the Bostitch T-5-8 or the Markwell L 3 M or equivalent which utilizes 9⁄16″ coated staples.

Nails shall be 1⅛″ Blued Plasterboard nail with 5⁄16″ head, or approved equal.

### APPLICATION

One-half inch USG Insulating Twin-Tile or Panel-Tile shall be nailed or stapled to joists or furring strips. Three nails or staples should be equally placed in the tongue on the long dimension and one in the tongue of the short dimension for secure fastening. All edges and grooves shall be in straight alignment.

## OPTIONAL INCLUSION APPLICATION OF TILE WITH ADHESIVES

***(Note: For use only over plasterboard or plaster surfaces.)***

### PREPARATION OF SURFACES

Surfaces shall be prepared for the application of Insulating Tile by removing grease, dirt or any loose or chalky substance that may prevent proper bond.

### MATERIALS

***(Note to Architect: Under this heading in the specification, delete the paragraph on nails and substitute the following.)*** Adhesive (describe) shall be an approved adhesive manufactured expressly for the purpose. The adhesive shall not be water soluble, contain ingredients that react chemically with paint, or contain a solvent that has a stronger solvent action on paint than naphtha. It shall not contain alcohol.

### APPLICATION

Adhesive shall be used over a dry surface only. It shall be used according to the directions of the adhesive manufacturer. Adhesive shall be applied to the back of the tile, working a small quantity of adhesive in spots about 3″ in diameter placed 2″ to 2½″ from edges and spaced approximately 8″ in each direction. Additional adhesive shall then be applied to these primed spots to a thickness of ⅜″ to ½″. No adhesive shall be applied to the wall or ceiling surface.

Tile then shall be placed against the surface about ½″ from its final position and slid into place. Pressure shall be exerted on the entire surface of the tile as it slides into place sufficient to provide suction to hold it in place until the adhesive sets. If necessary to bring a unit to proper level, remove and apply additional adhesive. Once the units are in place they shall not be pulled away from the base to level the surface.

## USG INSULATING ¾″ PANEL-TILE AND TWIN-TILE

### MATERIALS

Insulating Tile shall be (*specify size*) ¾″ USG Insulating Panel-Tile or Twin-Tile (Hilite) manufactured by the United States Gypsum Company.

Stapling machine shall be the Bostitch T-5-8 or the Markwell L 3 M, or equivalent which utilizes 9⁄16″ coated staples. Nails shall be 1⅛″, 13 ga. Blued Plasterboard nails with 5⁄16″ head, or approved equal.

### APPLICATION

Three-quarter inch USG Insulating Twin-Tile or Panel-Tile shall be nailed or stapled to furring strips. Three nails or staples should be equally placed in the tongue on the long dimension and two in the tongue of the short dimension for secure fastening. Tile shall be fitted together snugly but not forced. (Note: See optional inclusion for application by adhesive.)

## USG INSULATING PLANK

### MATERIALS

Insulating plank shall be (*specify size*) ½″ USG Insulating Plank, manufactured by United States Gypsum Company. Nails shall be 1⅛″ Blued Plasterboard nail with 5⁄16″ head.

Stapling machine shall be the Bostitch T-5-8, the Markwell L 3 M, or equivalent which utilizes 9⁄16″ coated staples.

### APPLICATION

***(Note to Architect: For vertical design of plank, the carpentry specifications shall include the placing of furring strips 10″ on centers on the lower five feet of wall and 16″ on centers on the upper portion of wall. For horizontal design, plank may be nailed direct to framing, not over 16″ on centers.)***

USG Insulating Plank shall be applied at right angles to framing members or furring strips. All end joints shall abut over supports. Units shall be selected at random and fitted together snugly but not forced. Staples or nails shall be applied in the nailing flange at each framing member or furring strip.

### OTHER USG INSULATION PRODUCTS

USG Asphalt Coated Sheathing.

USG Insulating Plaster Base.

USG Building Board—See A.I.A. File 37-A.

RED TOP* Insulating Wool—See A.I.A. File 37-B.

Acoustical Tile—See A.I.A. File 39-B.

Insulating SHEETROCK* Gypsum Wallboard—See A.I.A. File 23-L.

Insulating ROCKLATH* Plaster Base—See A.I.A. File 20-B-2.

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**Trademarks Reg. U.S. Pat. Off.*

# USG DECORATIVE INSULATION

## TECHNICAL DATA

| Product | Sizes | Weight per M Sq. Ft. | Decorative Effects | Edges |
|---|---|---|---|---|
| ½″ USG Insulating Twin-Tile | 12″x24″, 16″x32″ Simulates 12″x12″ or 16″x16″ Square Pattern | 800 Lbs. | Hilite or BLENDTEX | All products supplied with Kwik-Lok fitted Tongue & Grooved Edges. |
| ½″ USG Insulating Panel-Tile | 12″x24″, 16″x32″ (Rectangular Shape) | 800 Lbs. | Hilite or BLENDTEX | |
| ½″ USG Insulating Plank | 8″, 10″, 12″, 16″ Width, 8′, 10′, 12′ Length | 800 Lbs. | Hilite or BLENDTEX | |
| ¾″ USG Insulating Twin-Tile | 12″x24″, 16″x32″ Simulates 12″x12″ or 16″x16″ Square Pattern. | 1100 Lbs. | Hilite Only | |
| ¾″ USG Insulating Panel-Tile | 12″x24″, 16″x32″ (Rectangular Shape) | 1100 Lbs. | Hilite Only | |

These products meet strength and water resistance of Federal Specifications LLL-F-321b.

## CONDUCTIVITIES (k) AND CONDUCTANCES (C) FOR USE IN CALCULATING HEAT TRANSMISSION COEFFICIENTS

| PRODUCT | DESCRIPTION | Conductivity* or Conductance | | Resistance Per Inch Thickness | Resistance For Thickness Listed |
|---|---|---|---|---|---|
| | | (k) | (C) | $\frac{1}{k}$ | $\frac{1}{C}$ |
| ½″ USG Insulating Products | Tile, Plank, Building Board, Plaster Base | 0.33 | 0.66 | 3.03 | 1.51 |
| 25/32″ USG Insulating Products | Asphalt-Coated Sheathing | 0.33 | 0.42 | 3.03 | 2.37 |
| ¾″ USG Insulating Products | Insulating Tile | 0.33 | 0.42 | 3.03 | 2.37 |
| **AIR SPACES**<br>(Bounded by ordinary materials) | Vertical ¾″ or more in width | | 1.10 | | 0.91 |
| **EXTERIOR FINISHES** | | | | | |
| (Frame Walls) | | | | | |
| Brick Veneer | 4″ thick (nominal) | | 2.27 | | 0.44 |
| Wood Shingles | | | 1.28 | | 0.78 |
| Yellow Pine Lap Siding | | | 1.28 | | 0.78 |
| **INTERIOR FINISHES** | | | | | |
| Gypsum Plaster | | 3.30 | | 0.30 | |
| Gypsum Board—½″ | Plain or Decorated | | 2.82 | | 0.35 |
| Gypsum Lath & Plaster | Plaster Thickness ½″ | | 2.40 | | 0.42 |
| Insulating Board | | 0.33 | | 3.03 | |
| Plaster Base, ½″ Thick | Plaster Thickness—½″ | | 0.60 | | 1.67 |
| Metal Lath and Plaster | Plaster Thickness—¾″ | | 4.40 | | 0.23 |
| Wood Lath and Plaster | | | 2.50 | | 0.40 |
| **MASONRY MATERIALS** | | | | | |
| Brick | Face | | 2.30 | | 0.43 |
| 4″ Clay Tile (Hollow) | 1 Air Cell Direction Heat Flow | | 1.00 | | 1.00 |
| 6″ Clay Tile (Hollow) | 2 Air Cell Direction Heat Flow | | 0.64 | | 1.57 |
| 8″ Clay Tile (Hollow) | 2 Air Cell Direction Heat Flow | | 0.60 | | 1.67 |
| Concrete | Light Weight Aggregate | 2.50 | | 0.40 | |
| Concrete | Sand and Gravel Aggregate | 12.00 | | 0.08 | |
| 4″ Concrete Blocks | Hollow—Cinder Aggregate | | 1.00 | | 1.00 |
| 8″ Concrete Blocks | Hollow—Gravel Aggregate | | 1.00 | | 1.00 |
| 8″ Concrete Blocks | Hollow—Cinder Aggregate | | 0.60 | | 1.66 |
| 12″ Concrete Blocks | Hollow—Cinder Aggregate | | 0.53 | | 1.88 |
| **ROOFING MATERIALS** | | | | | |
| Asphalt Shingles | | | 6.50 | | 0.15 |
| Built-up Roofing | Assumed Thickness—⅜″ | | 3.53 | | 0.28 |
| Wood Shingles | | | 1.28 | | 0.78 |
| **SHEATHING** | | | | | |
| Gypsum—½″ | | | 2.82 | | 0.35 |
| Insulating Board—25/32″ | | | 0.42 | | 2.37 |
| Fir & Yellow Pine (1″) | Actual Thickness—25/32″ | | 1.02 | | 0.98 |
| **SURFACES** | | | | | |
| Still Air | Ordinary Non-Reflective Materials | | 1.65 | | 0.61 |
| 15 MPH Wind Velocity | Ordinary Non-Reflective (Vertical) Mat'ls | | 6.00 | | 0.17 |
| **WOODS** | | | | | |
| Yellow Pine or Fir | | 0.80 | | 1.25 | |
| Fir Sheathing—Building Paper and Yellow Pine Lap Siding | | | 0.50 | | 2.00 |

*Expressed in Btu per sq. ft. per hr. per deg. F. temperature difference. Conductivities (k) are per inch thickness and conductances (C) are for thickness or construction stated, not per inch of thickness.

TECHNICAL INFORMATION

# TEXOLITE*

## PAINT PRODUCTS

**UNITED STATES GYPSUM**
The Greatest Name in Building

GENERAL OFFICES—300 WEST ADAMS STREET, CHICAGO 6, ILLINOIS

1955

*T. M. Reg. U. S. Pat. Off.

# TEXOLITE PAINT PRODUCTS

## INTERIOR FINISHES FOR WALLS AND CEILINGS

| PRODUCT | DISTINGUISHING CHARACTERISTICS | FORM | PRIMING | USES AND LIMITATIONS |
|---|---|---|---|---|
| DURAVAL—latex base emulsion wall paint. Available in white, tints and custom colors. Provides durable scrubbable velvet finish. | Ready to use. Will dry to the touch in one hour. No objectionable painty odor. Rubberized Copolymer binder provides excellent adhesion and durability. Recoatable. | Ready to use | New wood and unpainted metal, including exposed nailheads, should be specially primed. All other surfaces will require only one or two coats of DURAVAL. | Over old and new interior walls and ceilings in homes, apartments, offices, stores, schools, hospitals, factories and warehouses. Wide variety of colors available by intermixing standard colors and Custom Colors. |
| DURAVAL Trim Gloss—A latex gloss additive to be used with DURAVAL to provide a semi gloss finish. | A gloss additive. To be mixed with DURAVAL up to one part DURAVAL Trim Gloss to one part of DURAVAL to provide a semi gloss finish for use on trim. | Liquid | New wood and unpainted metal, including exposed nailheads, should be specially primed. All other surfaces will require two coats of the DURAVAL and DURAVAL Trim Gloss mix. | Over painted or primed woodwork and metal trim. May be used on interior walls and trim in homes, apartments, offices, stores, schools, hospitals, factories and warehouses. |
| Housing Specification Alkyd Flat Latex Paint—An alkyd latex base emulsion wall and ceiling paint available in white and tints. | Ready to use. May be adjusted to job conditions by addition of a small amount of water per gallon. Beautiful flat finish. Extremely washable and durable. No objectionable painty odor. Recoatable. | Ready to use | New wood and unpainted metal, including exposed nailheads, should be specially primed. Other surfaces will require only one or two coats of Housing Specification Alkyd Flat Latex Paint. | Over old and new interior walls and ceilings in homes, apartments, offices, stores, schools, hospitals, factories and warehouses. Standard colors may be intermixed providing a wide range of colors. |
| TEXOLITE Imperial—White and tints. A washable, water-thinned oil resin flat paint for interior walls and ceilings. Affords beautiful flat surface with good washability at minimum cost. | Thinned with water. Dries in one hour. No prime or size coat required for most paint jobs. Use large brush for fast application. No objectionable painty odor. No fire hazard during application. Recoatable. Cuts painting time and costs. | Paste | See general specifications | Over old and new interior walls and ceilings in homes, hotels, apartments, offices, stores, shops, schools, hospitals, factories and warehouses. Not recommended for use over wood trim subject to wear, or under damp conditions, or where it will be subjected to excessive abrasion. |
| TEXOLITE Standard—White and tints. Cleanable water-thinned casein flat paint for interior wall and ceiling decoration. Provides brighter, more colorful interior decoration that is long-lived and inexpensive. | Dries in one hour. High light reflection and excellent hiding power due to high quality pigment. Easy to apply. No objectionable painty odor. No fire hazard. No thinner coat. Recoatable. Cuts maintenance costs. | Paste | See general specifications | Over old and new interior walls and ceilings in homes, hotels, apartments, offices, stores, shops, schools, hospitals, factories and warehouses. Not recommended for use over wood trim, or where there is damp condition or where it will be subject to excessive abrasion. |

## INTERIOR TEXTURE FINISHES

| | | | | |
|---|---|---|---|---|
| TEXOLITE Texture—A rubberized sand finish paint available in 17 colors, a heavy bodied sand finish latex emulsion. | TEXOLITE Texture gives a beautiful flat sand finish to walls and ceilings, covers minor imperfections in new and old walls. | Ready-To-Use Heavy Bodied | New wood and unpainted metal, including exposed nailheads, should be specially primed. All other surfaces will require only one or two coats of TEXOLITE Texture. | Produces a beautiful flat sand finish on interior walls and ceilings, provides complete dispersion of aggregate, is extremely washable, covers dry wall joints, plaster cracks, dents and blemishes and other minor imperfections in new and old walls. |
| TEXOLITE Ripple—A latex stipple finish. Provides a flat washable stipple or light texture finish. | A heavy bodied ready-to-use latex stipple available in white and tints, excellent hiding power. No objectionable painty odor. | Ready-To-Use Heavy Bodied | See general specifications | A ready-to-use latex emulsion that will provide a stipple or light texture in a flat washable finish. Can be used over painted or unpainted plaster, painted or unpainted gypsum wallboard and other interior walls and ceilings. Can be used in homes, apartments, offices, stores, schools, hospitals, factories and warehouses. |
| TEXTONE—A plastic paint meeting the demand for a dependable, economical, easily applied texture medium capable of satisfying every requirement of modern decoration. | TEXTONE properly applied forms a texture surface of superior hardness. Furnished in white only. Can be integrally tinted with TEXOLITE Imperial or Standard. | Powder | See general specifications | For producing light, modern textures as well as the heavier period designs over any dry, solid, clean interior surface. For decorating work over new plaster, gypsum wallboards, and insulating wallboards. Especially useful in refinishing cracked plaster surfaces; for producing stone effects, antique effects and stencil work. |
| USG Colored Texture Paint—A popular paint that is easy to use. It provides a wide range of texturing possibilities and is lower in price than TEXTONE paint. Available in white and 7 standard tints. | A good working plastic paint for uses similar to those secured with TEXTONE. Somewhat less coverage per pound. Provides excellent textures in both modern and period styles. | Powder | See general specifications | For interesting textures over dry, clean, solid surfaces such as new plaster, gypsum wallboards, insulating wallboards, etc. Also on old cracked plaster surfaces. |

The following trademarks are owned and/or registered in the United States Patent Office by United States Gypsum Company and are used by it to distinguish its paint and painters' supply products. TEXOLITE, DURAVAL, TEXTONE, CEMENTICO, DURA-DRI, DURA-STOP, RED TOP, PERF-A-TAPE, and SHEETROCK.

# TEXOLITE PAINT PRODUCTS

## EXTERIOR PAINTS

| PRODUCT | DISTINGUISHING CHARACTERISTICS | FORM | PRIMING | USES AND LIMITATIONS |
|---|---|---|---|---|
| DURA-DRI—White and tints. A heavy bodied protective coating that controls water penetration. | Protects and beautifies interior and exterior masonry surfaces. A heavy bodied protective coating that fills the pores of masonry surfaces through which water has been seeping. It also beautifies basement walls and exterior masonry bonding to and actually becoming part of the surface. | Powder | Masonry surface should be dampened thoroughly prior to application. | Use only over unpainted porous masonry surfaces such as brick, clay tile, portland cement, stucco, concrete, unpolished building stone and similar surfaces. Not recommended on magnesite stucco, asbestos cement shingles, non-porous masonry or non-masonry material. |
| DURA-STOP—Is a dry powder hydraulic compound, requires only water for mixing. Stops water under pressure from coming through cracks, breaks or holes in porous masonry. | Sets in 3 to 5 minutes and stops water under pressure from coming through cracks, breaks and holes in porous masonry. It must be held in place. Becomes harder and more water resistant in the presence of water. | Powder | Masonry surface should be dampened thoroughly prior to application. | DURA-STOP is specifically designed for filling cracks and holes in masonry prior to the application of DURA-DRI. DURA-STOP will stop the flow of water even when the water is under pressure. DURA-STOP is a hydraulic cement that sets in 3 to 5 minutes. DURA-STOP may also be used to anchor washing machines, motors and other fixtures to concrete floors and walls. Do not use on non-porous masonry or non-masonry surfaces. |
| CEMENTICO—White and tints. Hydraulic cement base paint for bringing new beauty, life and color to porous masonry surfaces. | Made of white portland cement and other special ingredients to produce hardness, binding qualities and workability. Only lime-proof colors are used. Durable. Water resistant. Bonds to porous masonry surfaces. | Powder | Masonry surface should be dampened thoroughly prior to application. | Use only over unpainted porous masonry surfaces such as brick, clay tile, portland cement stucco, concrete, unpolished building stone and similar surfaces. Not recommended on magnesite stucco, wood painted or greasy surfaces, smooth plaster, terra cotta, glazed brick and tile, vibrated or very dense concrete areas, floors, asbestos-cement shingles and similar non-porous or non-masonry materials. |
| TEXOLITE Exterior—White and tints. An exterior paste paint thinned with water. Gives a beautiful, durable, exterior finish to masonry surfaces. May be brushed or sprayed. | Dries quickly. Affords true color beauty with a durable finish. Does not require spraying with water to bring about set after application. | Paste | See general specifications | For use on painted or unpainted masonry surfaces, also on unglazed brick and tile and on unglazed weathered asbestos cement siding. Do not use on magnesite stucco surfaces, glazed brick, or tile, polished stone, nor as a floor paint. |

## SURFACE PREPARATION PRODUCTS

| | | | | |
|---|---|---|---|---|
| SHEETROCK Sealer—A resin emulsion sealer designed specifically for application over gypsum wallboard. | Ready to use. Ease of application. May be tinted with DURAVAL. | Ready to use | See general specifications | For use over gypsum wallboard to seal PERF-A-TAPE Joints, lay the nap of the paper, and prepare the surface to receive oil stipples, enamels, flat oil paints, water thinned paints and latex base paints, and as a size under wallpaper. |
| USG Plaster Sealer—A pigmented primer sealer. Oil-Resin emulsion base. Particularly excellent for use over newly plastered surfaces. | Ready to use. Easy to apply. May be tinted with DURAVAL. | Ready to use | See general specifications | For use over both new and old interior wall surfaces. Unusually fine as a primer-sealer over new plaster under latex base and conventional wall paints. |
| TEXOLITE Primer—A priming material which "locks in" lime or alkali and makes possible more durable paint jobs. Equalizes "suction." Provides "tooth" to which paint clings tightly. | Assures longer life for decorative materials. Produces a hard, lime locking prime coat over which may be applied rubber-emulsion paints, water-thinned paints, oil paints, enamels. | Powder | See general specifications | For priming new plaster, old painted walls, interior concrete surfaces, unpainted dry concrete floors, gypsum and insulation wallboard. |
| TEXOLITE Paste Spackling Putty—Used to prepare surfaces before painting or decorating to build up or fill imperfections to provide a smooth even surface. | This is a ready to use paste spackling material of exceptionally fine grind, adaptable to knife or brush application. Can be sanded. Adheres to any properly cleaned solid surface. Hardens in a few hours forming a tough, durable surface. | Paste | See general specifications | Used to fill small cracks, scars, slight imperfections in plaster, nicks, cracks, knotholes or nail holes in wood trim, nail holes in wallboards. To fill voids or imperfections in concrete, cracks in tile or mosaic, household repairs on furniture, toys, etc. For interior use only. |
| TEXOLITE Spackling Putty—Used for preparatory treatment of surfaces before painting or decorating to build up or fill imperfections, and to produce a smooth even surface. | Exceptionally fine grind. Grit-free. Adaptable to knife or brush application. Can be sanded. Adheres to any properly cleaned, solid surface. Hardens in a few hours, forming a tough, durable surface. | Powder | See general specifications | Filling small cracks, scars, slight imperfections in plaster, nicks, cracks, knotholes or nail holes in wood trim. Spotting nail holes or cracks in concrete, cracks in tile or mosaic, for treating canvas and wall fabrics. For household repairs on moulding, furniture, toys, etc. For making Swedish Putty. |
| RED TOP Patching Plaster—A plaster scientifically compounded for patching cracks in walls and ceilings easily and efficiently at minor expense. | Very white. Contains no lime. Sets in 1 to 1½ hours. Uniform set and quality. | Powder | See general specifications | For patching cracks and larger breaks in plaster walls. Can be decorated with any decorating material. |
| RED TOP Painters' Plaster—Plaster of Paris for general painters' use. Made from specially selected white gypsum. | Mixes readily, works easily. Provides hard, dense and strong surfaces. Setting time approximately 30 minutes. | Powder | See general specifications | Recommended for patching cracks and breaks in plaster and wherever a fast setting patching material is required. |
| PERF-A-TAPE Joint System—Designed to conceal and reinforce gypsum wallboard joints and to reinforce large plaster cracks. | Provides complete concealment and adequate reinforcement. | Combination package of powder and tape or Powder only. | See general specifications | Used in both new and old construction. Developed for treating joints in wallboard. Used to reinforce cracks in all kinds of wall surfacings especially in corners or at angles before redecorating. |

# TEXOLITE PAINT PRODUCTS

## GENERAL SPECIFICATIONS

### I. GENERAL CONDITIONS

The painting contractor shall read and be governed by the general conditions at the head of the complete specifications for this project.

### II. MATERIALS

1. Deliver in original containers.
2. Store in protected place to protect from damage by elements and tampering.
3. Use all materials in strict accordance with manufacturer's directions.

### III. MASTER SPECIFICATIONS

### A. INTERIOR WORK

All surfaces must be dry, sound, clean, free of dust, grease, or oil.

### 1. PLASTER

Fill all nicks, cracks, gouges, and other surface imperfections with Texolite paste or powder spackling putty. Use Red Top Patching Plaster to repair large holes and cracks in plaster. Repaired surfaces shall be sanded smooth and dust removed.

***NEW PLASTER***

Do not paint until dry.

**FLAT FINISH**

***(a) Pastels***

2 coats of Housing Specification Alkyd Flat Latex Paint or
1 coat Texolite Primer or USG Plaster Sealer tinted to approximate shade of finish coat.
1 or 2 coats of Texolite Standard, Texolite Imperial or flat oil paint.

***(b) Deep Tones***

1 or 2 coats USG Plaster Sealer tinted to the approximate shade of the finish coat.
1 or 2 coats of Texolite Standard, Texolite Imperial or flat oil paint.
1 or 2 coats of Housing Specification Alkyd Flat Latex Paint.

**VELVET FINISH—Rubber Emulsion Base Paints**

1 coat of Texolite Primer or USG Plaster Sealer tinted to the approximate shade of finish coat.
1 or 2 coats of Duraval.

***(Note—***
***Use of TEXOLITE primer assures that no free lime is available to saponify the oil in paint film.)***

**OLD PLASTER PREVIOUSLY PAINTED**

Remove all loose or scaling paint and repair as outlined under plaster.

**FLAT FINISH**

***(a) Pastels***

1 or 2 coats of Housing Specification Alkyd Flat Latex Paint.
1 or 2 coats Texolite Standard or Texolite Imperial.

***(b) Deep Tones***

1 or 2 coats of Housing Specification Alkyd Flat Latex Paint or
1 or 2 coats USG Plaster Sealer tinted to the approximate shade of finish coat.
1 or 2 coats of Texolite Standard, Texolite Imperial or flat oil paint.

**VELVET FINISH—Rubber Emulsion Base Paints**

1 or 2 coats Duraval.

### 2. GYPSUM WALLBOARD

Prepare joints and nailheads with Perf-A-Tape Joint System in accordance with manufacturer's directions.

**FLAT FINISH**

1 or 2 coats of Housing Specification Alkyd Flat Latex or
1 coat Texolite Primer or Sheetrock Sealer tinted to approximate shade of finish coat.
1 coat Texolite Standard, Texolite Imperial or flat oil paint.

**VELVET FINISH—Rubber Emulsion Base Paint**

1 coat Texolite Primer or Sheetrock Sealer tinted to approximate shade of finish coat.
1 or 2 coats of Duraval.

**SEMI-GLOSS FINISH**

1 coat Sheetrock Sealer tinted to approximate shade of finish coat.
1 or 2 coats of Duraval and Duraval Trim Gloss mix or
1 or 2 coats of oil type Semi-Gloss Paint as required.

**HIGH GLOSS FINISH**

1 coat Sheetrock Sealer.
1 coat enamel undercoater (tinted to approximate shade of finish coat).
1 coat of Gloss Enamel.

**TEXTURED FINISH**

1 coat Textone of consistency to provide desired texture.
(Tint Textone to approximate shade of finish coat.)
1 or 2 coats Duraval or Housing Specification Alkyd Flat Latex or
1 or 2 coats Texolite Standard or Texolite Imperial or
1 or 2 coats USG colored Texture paint of consistency to provide desired texture.

**SAND FINISH TEXTURE**

1 or 2 coats of Texolite Texture.

**STIPPLE FINISH**

1 or 2 coats of Texolite Ripple, or
1 coat Sheetrock Sealer tinted to approximate shade of finish coat.
1 coat of oil stipple paint.

**WALLPAPER OR WALL FABRIC COVERINGS**

1 coat Sheetrock Sealer.
Apply wallpaper or wall covering in accordance with the manufacturer's directions. A size over Sheetrock Sealer is recommended.

### 3. WOOD SURFACE (except floors)

New wood (not previously painted); sand smooth, touch up knots, sap streaks, pitch spots with shellac.
1 coat Pigmented Oil Primer Sealer.
1 or 2 coats Duraval.
For Semi-Gloss Finish.
1 or 2 coats Duraval and Duraval Trim Gloss mix.

### 4. METAL

Remove grease, oil and plaster spatterings.
1 coat of rust inhibitive primer.
1 or 2 coats of Texolite Duraval.
For Semi-Gloss use Duraval and Duraval Trim Gloss mix.

### 5. ACOUSTICAL TILES (Perforated and heavily fissured)

1 or 2 coats Texolite Standard, Texolite Imperial, Duraval or Housing Specification Alkyd Flat Latex.

### 6. ACOUSTICAL PLASTER AND LIGHTLY FISSURED TILE

1 coat of Texolite Standard or Texolite Imperial reduce in the proportion of 1 gallon Paste Paint to 1 gallon of water.
1 coat of Texolite Standard or Texolite Imperial reduced in the proportion of 1 gallon Paste Paint to 2 gallons of water.

### 7. INSULATION BOARD (Hardboard and other composition wallboards)

1 or 2 coats Texolite Standard, Texolite Imperial, Duraval, Housing Specification Alkyd Flat Latex.
***(NOTE—When using deep tones of TEXOLITE Standard or TEXOLITE Imperial, seal surface with Pigmented Oil Primer Sealer tinted to approximate shade of finish coat.)***

### 8. INTERIOR MASONRY

Surfaces such as concrete block, brick, stucco, monolithic concrete and unglazed tile. All surfaces must be dry.

**WASHABLE VELVET FINISH**

1 coat Texolite Primer tinted to approximate shade of finish coat.
1 or 2 coats Duraval.

**FLAT FINISH—Water Thinned Paints**

1 coat Texolite Primer tinted to approximate shade of finish coat.
1 or 2 coats Texolite Standard or Texolite Imperial, or Housing Specification Alkyd Flat Latex.
***(NOTE—On unpainted masonry surfaces use of TEXOLITE Primer assures that no free lime is available to saponify the oil in paint film.)***

**CONTROL WATER PENETRATION**

Use Dura-Stop to stop the flow of water through cracks or holes then apply Dura-Dri to the dampened porous masonry surface. Keep surface moist for about 12 hours for complete curing of the Dura-Dri.

**PORTLAND CEMENT BASE PAINT FINISH**

**2 coats CEMENTICO**

2 coats Cementico.

### 9. EXTERIOR WORK—Masonry Surfaces

All surfaces must be porous, free from oil, grease and efflorescence, patch cracks or openings with Dura-Dri, Dura-Stop or 1 part Texolite Cementico mixed with 2 parts clean sharp sand. Texture to duplicate original surface. Remove any rust stains.

**PORTLAND CEMENT BASE PAINT FINISH**

For application to unpainted, porous masonry surfaces such as brick, concrete masonry units, unglazed tile, stucco, etc., or similar surfaces which have been painted only with Portland Cement base paints. Surface must be wet down immediately prior to painting until it no longer absorbs water. Stir paint frequently to prevent settling. Do not apply in direct sunlight. Temperature must be above 50° F. during application and for 48 hours afterwards. Do not paint during rainy spell. Allow 24 hours drying time between coats.
2 coats Cementico.
***(NOTE—When application is over cement or lightweight aggregate block use following mix for first coat—2 lbs. clean sharp sand mixed with 5 lbs. CEMENTICO.)***
Use 1 coat Dura-Dri for control against water penetration.
Use 1 coat Cementico for decoration.

**OIL RESIN EMULSION PAINT FINISH**

Apply to all unpainted or previously painted masonry surfaces except magnesite stucco, glazed brick or tile, terra cotta, or polished stone. Do not apply when temperature or surface is below 40° F. Do not paint if rain is forecast within 24 hours after application. This is a non-penetrating paint and must not be applied over any surface that is flaky, crumbling, dirty or chalking.
2 coats Texolite Exterior.

TECHNICAL INFORMATION

# USG* INSULATION

## STRUCTURAL TYPE

UNITED STATES GYPSUM
The Greatest Name in Building

GENERAL OFFICES—300 WEST ADAMS STREET, CHICAGO 6, ILLINOIS

1955

*T. M. Reg. U. S. Pat. Off.

# USG STRUCTURAL INSULATION

### DESCRIPTION

USG Structural Insulation is a rigid wood fiber insulating board made into sheathing, plaster base, building boards and roof insulation. The products are fabricated from homogeneous mats manufactured of wood fiber produced from new timber.

### FUNCTION AND UTILITY

**Structural Strength.** Tensile strength and bracing strength are greatly in excess of the strength required for the designed purpose.

**Insulating Value.** The "k" value of USG Insulation is 0.33 and its resistivity compares with approximately 38″ of stone concrete. See the Heat Transmission Coefficient Table on opposite page.

**Light Weight.** The 25/32″ thickness weighs approximately 1200 pounds per M square feet. The ½″ thickness weighs approximately 725 pounds per M square feet.

**Tensile Strength.** USG Structural Insulating products exceed all requirements set up by Federal Specification LLL-F-321b.

## USG INSULATING SHEATHING

An insulating exterior wall sheathing integrally treated to make it moisture resistant. The 25/32″ x 2′ x 8′ size has a tongue and grooved joint on the long edges. The ½″ x 2′ x 8′ size has a V-joint on the long edges. Other sizes, 4′ wide by 8′, 9′, 10′ or 12′ long, have square edges and are either 25/32″ thick or ½″ thick.

**Strength.** A wall sheathed with 25/32″ USG insulating sheathing possesses greater bracing and stiffening strength than a wall sheathed horizontally with conventional narrow sheathing units. Tests conducted at the Forest Products Laboratory, Madison, Wisconsin, indicate that a wall sheathed with 25/32″ structural insulating board sheathing, has a rigidity factor of 3.0 compared to a factor of 1.0 for horizontal wood sheathing. USG 25/32″ sheathing meets the structural requirements established in F.H.A. Technical Circular No. 12, covering the use of 4 foot wide insulating sheathing without diagonal bracing.

**Wind-Tight.** USG Insulating Sheathing, 25/32″ x 2′ x 8′, is provided with a fitted tongue and groove joint on longitudinal edges and ends are joined over supports, thus making wind-tight joints. The use of building paper is unnecessary and not recommended.

### *COSTS*

The material cost is low, and waste from these large units is negligible. Approximately 1200 square feet is erected per man per day.

## USG SHINGLE-BACKER

USG Shingle-Backer is used as an insulating undercourse for wood shingles or shakes. It eliminates the use of wood shingles for such undercourses. It may be used over 25/32″ USG Insulating Sheathing or wood sheathing.

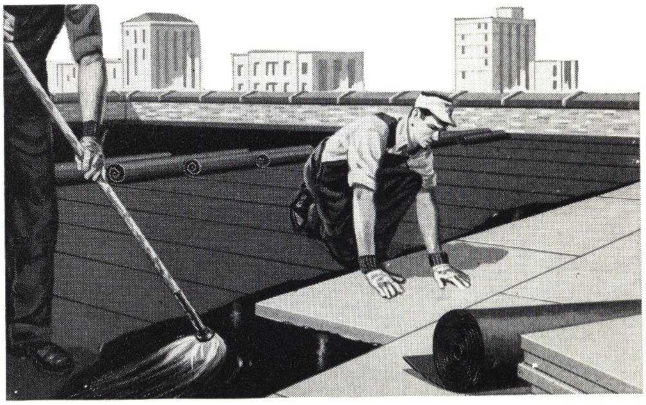
Strength—This new method of applying outer course shingles or shakes over Shingle-Backer and 25/32″ USG Insulating Sheathing has been thoroughly tested for strength and holding power and exceeds the structural requirements established by FHA Use-of-Materials Bulletin No. UM-14.

## USG INSULATING BUILDING BOARD

An all-purpose insulating board made in two thicknesses: ½″ and 1″. Sheet sizes are 4′ wide by 6′, 7′, 8′, 9′, 10′ and 12′ long. Furnished with a 70 to 80 per cent light reflective ivory colored surface coating which makes further decoration unnecessary.

## USG ROOF INSULATION

An insulation board product, when laid over wood, concrete, gypsum or steel decks, not only provides comfort for the areas below, but acts as a foundation for the built-up roof covering. The individual fibers of USG Roof Insulation are chemically treated to make them moisture resistant. USG Roof Insulation is supplied in 24″ x 48″ size with square edges. Both plain fiber and asphalt treated are available in ½″, 1″, 1½″ and 2″ thicknesses to meet varied insulation requirements. Meets or exceeds all requirements of federal specs LLL-F-3216 class C.



## LIMITATIONS OF USE

1. Supports should not exceed a centering of 16″.
2. Resin emulsion and casein paints, such as TEXOLITE*, may be applied to USG Insulating Building Board without sizing. For lead and oil coatings, the surface should be sized to conserve paint.

**Trademark Reg. U. S. Pat. Off.*

# USG STRUCTURAL INSULATION

## TECHNICAL DATA

| Products & Size | Thick-ness | Color | Edge | Wt. Per M Sq. Ft. | Pcs. Per Bdl. |
|---|---|---|---|---|---|
| USG Insulating Building Board 4′ x 6′, 7′, 8′ 9′, 10′ & 12′ | ½″<br>1″ | Hilite<br>Hilite | Square<br>Square | 750<br>1500 | 6<br>3 |
| USG Insulating Sheathing 2′ x 8′ | 25/32″<br>½″ | Asphalt Coated or Impregnated | T&G Long Sides<br>"V" Joint | 1200<br>860 | 6<br>9 |
| USG Insulating Sheathing 4′ x 8′, 9′, 10′ & 12′ | 25/32″<br>½″ | Asphalt Coated or Impregnated | Square<br>Square | 1200<br>860 | 4<br>6 |
| USG Insulating Plaster Base (Plain Only) 18″ x 48″ | ½″ | Natural | "V" Joint Long Sides | 740 | 15 |
| Duplex Wallboard 4′ x 6′, 7′, 8′ 9′, 10′ & 12′ | ⅜″ | Hilite Only | Square | 550 | 8 |
| USG Roof Insulation 24″ x 48″ | ½″<br>1″<br>1½″<br>2″ | Natural or Asphalt Coated | Square<br>Square<br>Square<br>Square | 750<br>1500<br>2250<br>3000 | 14<br>7<br>5<br>4 |
| USG Shingle-Backer<br>13½″ x 48″<br>15½″ x 48″ | <br>⅜″<br>⅜″ | Asphalt Coated or Impregnated | Square | 550 | <br>25<br>22 |

See AIA Folder 37-B for chart on Conductivities (k) with Conductivities (c) for use in calculating heat transmission coefficients.

## SPECIFICATIONS

### USG INSULATING SHEATHING

### SCOPE

Unless otherwise shown on plans, all exterior walls shall be sheathed according to these specifications.

### MATERIALS

**Sheathing** shall be USG Insulating Sheathing, manufactured by United States Gypsum Company.

**Nails** shall be galvanized, 7/16″ head diameter, 1¾″ long roofing nails for 25/32″ sheathing, and 1½″ long for ½″ sheathing.

### APPLICATION

Apply USG 25/32″ or ½″ Insulating Sheathing with the long dimension across the supports and with the protruding edge up. Ends of sheets shall abut over centers of supports, and all end joints shall be staggered.

Apply 25/32″ or ½″ by 4 ft. wide sheathing with long dimension parallel with the supports. Sides and ends shall abut the vertical framing members, top and bottom plates or headers. Fit snugly around all window and door openings.

Secure sheathing to studs with nails spaced approximately 3″ on outside framing members (6″ apart on intermediate framing) except where exterior finish is secured to the frame with nails driven through the sheathing and into the studs, in which case nails shall be spaced approximately 8″ on centers.

Nail to intermediate studs first. Nails shall be not less than ⅜″ from edges or ends of sheathing.

### OPTIONAL INCLUSION

**1. Use of wood siding over USG Insulating Sheathing.** Apply siding directly over sheathing, securing it with nails driven through sheathing and into studs. Nails shall have a minimum penetration of 1¼″ into the studs. End joints of siding shall be over centers of studs.

**2. Use of masonry veneer over USG Insulating Sheathing.** Masonry ties shall be attached with nails driven through the sheathing into the studs, approximately 12″ on centers, vertically, using nails of sufficient length to penetrate 1¼″ into the studs. (At least 6d common nails.)

**3. Use of wood, asbestos cement or slate shingles over USG Insulating Sheathing.** (1) Apply 1″ x 2″ wood furring strips horizontally over the sheathing spaced to correspond to the shingle exposure. Secure strips with nails driven through sheathing, using nails of sufficient length to provide at least 1¼″ penetration into studs (at least 8d common). Use at least one nail at each intersection of stud and furring. (2) Refer to Sweet's catalog 12b/Un for method of attaching straight edge asbestos shingles by means of USG SHADOW-LOCK Attachment System.

# USG STRUCTURAL INSULATION

## SPECIFICATIONS (Cont'd)

### USG SHINGLE-BACKER

**Scope**
Unless otherwise shown on plans, all exterior walls shall be finished with cedar shingles or shakes and insulating undercourse.

**Materials**
Cedar shingles or shakes shall be (specify size, color and manufacturer). Insulating undercourse shall be ⅜″ USG Shingle-Backer 13½″ x 48″ for 16″ shingles, maximum exposure 12″ —15½″ x 48″ for 18″ shingles, maximum exposure 14″, as manufactured by the United States Gypsum Company.

**Application—Over 25/32″ USG Insulating Sheathing**
Shingle-Backer for the first course of shingles should be applied over a cant strip of wood lath or other ⅜″ wood strip. Apply Shingle-Backer so that end joints center on studs. Stagger end joints of Shingle-Backer. Nail with 8d galvanized box nails along the lower edge at each stud location—4 nails per piece —do not nail closer than ⅜″ to edge of Shingle-Backer. Leave ⅛″ space between end joints of Shingle-Backer. Extend the butts of shingles ½″ below the edge of the Shingle-Backer. Nail along the butt edge with 2″ annular ringed galvanized nails. 2 nails for 6″ shingles approximately 1½″ above butt edges. Shingles 6″ to 10″ in width—use 3 nails. Shingles over 10″—use 4 nails. Joints of shingles should not fall over joints of Shingle-Backer.

**Application—Over Wood Sheathing**
Nail Shingle-Backer along top edge to wood sheathing using 4d—1½″ galvanized nails. Space nails not over 16″ o.c. Apply wood shingles with 5d—1¾″ galvanized nails in accordance with shingle manufacturer's specifications.

### USG ROOF INSULATION

**Scope**
As shown on plans the following roof areas shall be insulated with fiber board rigid roof insulation.

**GENERAL**
All insulation shall be kept dry during and after application. The surface of the roof deck shall be sound, broomed clean, free from dirt, reasonably smooth and thoroughly dry. Only as much USG Roof Insulation shall be laid over roof area as can be covered with finished roofing in one day. Boards shall be placed together snugly but never forced into place. Boards shall be laid in parallel courses with end joints of each course breaking with those adjoining courses.

**MATERIAL**
Insulation shall be (specify thickness ½″—1″—1½″—2″) USG Roof Insulation as manufactured by the United States Gypsum Company, laid in (one) (two) layer (s). Size shall be 24″ x 48″.

**VAPOR BARRIER**
Vapor barriers shall be used on decks of heated buildings wherever the average January temperature is below 45°F. Vapor barriers shall be used on all buildings in which excessive moisture conditions prevail. The vapor barrier shall consist of two plies of 15 lb. felt solidly mopped together, or a simple ply of 45 lbs. per square coated asphalt roofing felt, applied with coated surface down. The vapor barrier shall be wrapped around the insulation and mopped back 6 inches at walls and other vertical projections.

**WATER CUT OFFS**
The roof insulation shall be isolated in areas not greater than 30 square feet over the entire roof and at first full insulating board joint back from parapet walls or borders.

**APPLICATION—Over Wood Decks Where No Vapor Barrier is Used**
Space nails 12 inches apart. Each board shall be secured in place by nailing each edge and staggered along the longitudinal center line. If two layers of insulation are used, nailing should be through both layers. Use large-headed galvanized nails (not less than 7/16 inch head) of sufficient length to pass through the insulation and penetrate the roof boards at least ¾″. Nails should not pass through the roof deck.

**Over Wood Roof Deck with Vapor Barrier Coal Tar Pitch**
The wood deck shall be covered with red rosin sheathing paper and two plies of 15 lbs. tarred felt. Lay successive felt plies with 19″ overlap and solidly mop between plies. The laps to be front nailed on 18″ centers with caps and nails.

**VAPOR BARRIER—Asphalt Application**
Over the entire roof apply a vapor barrier consisting of two plies of 15 lbs. asphalt felt, each sheet laid 19 inches over the preceding one, and each sheet back-nailed at intervals not to exceed 18″. Mop solidly the 19 inch lap with steep roofing asphalt.

**Alternate:**
Apply a vapor barrier sheet of 45 lb. coated (both sides) asphalt roofing felt, lapping each sheet 4″ and solidly cementing these laps. Nail each lap with galvanized barbed roofing nails spaced not over 2″ O.C.

**Application of Insulation by Mopping**
Embed each board firmly in a solid mopping of bitumen. Only sufficient area to provide complete embedment of each insulating board shall be mopped at a time. Where two layers of insulating board are to be applied, solid mop the exposed surface of the first layer liberally with hot bitumen. Embed each board of the second layer firmly in the solid mopping of bitumen.

**Application Over Concrete, Gypsum and Unit Tile**
Priming the deck—If coal tar pitch is used no primer is necessary. If asphalt is used, prime the deck with asphalt primer.

**VAPOR BARRIER**
A vapor barrier shall be used in all cases on poured concrete and poured gypsum decks. Apply two plies of 15 lbs. felt lapped half. Each ply shall be solidly mopped to the deck and also between plies, followed by thorough brooming down of felts. If deck is of poured gypsum, strip or center mopping shall be used. Over precast cement slabs, gypsum plank, book tile or similar units, apply (insulation board) (vapor barrier) directly to deck by spot strip or center mopping, keeping the mopping back approximately 4 inches from the joints when using pitch. If steep asphalt is used, it may be solidly mopped.

**Application of Insulation**
See application by mopping.

**STEEP ROOF DECKS**
On steep roof decks having a slope of 3 inches or more per foot, provision shall be made for additionally securing the roof insulation by nailing or other mechanical fastening in accordance with the roofing manufacturers' requirements.

**Application Over Steel Deck**
The steel deck shall have a shop coat of paint or primer. Pitch shall not be used for bonding felt or insulation to steel decks. Application of insulation—see application by mopping.

**Steep Roof Decks**
Where insulating board is applied over roof decks having a slope of 1″ or more per foot, each board shall be secured to the steel deck with mechanical fasteners supplied by the deck manufacturer. Mopping of bitumen should be used to augment the mechanical fasteners.

**Application of Roofing**
Built-up roofing shall be applied in accordance with manufacturer's specifications.

AIA FILE NUMBER 37-B

TECHNICAL INFORMATION

# RED TOP*

## INSULATING WOOL

UNITED STATES GYPSUM
The Greatest Name in Building

GENERAL OFFICES—300 WEST ADAMS STREET, CHICAGO 6, ILLINOIS

1955

*T. M. Reg. U. S. Pat. Off.

AIA FILE NUMBER 37-B

# RED TOP* INSULATING WOOL

## DESCRIPTION

**RED TOP Insulating Wool** consists of mineral fibers mechanically formed either into a uniform mat of definite dimensions and controlled density or into a uniform pellet form suitable for pouring or blowing into framing spaces.

**RED TOP Blankets**—Are enclosed, except for mill cut ends. Face of enclosure is glossy asphalted paper, an effective vapor barrier, extending beyond the edges of the blanket to form nailing flanges. These flanges are wide enough that the edges are overlapped when applied to studs, thus forming a continuous vapor barrier. A strong, yet porous, paper on the back, completes the enclosure. See table below for sizes.

**RED TOP Nodulated Wool**—Consists of mineral fibers formed into pellets for either pouring and spreading by hand or for the installation by pneumatic methods.

## FUNCTION AND UTILITY

**High Thermal Resistance**—Conductance is 0.27 per inch thickness and Resistance 3.70 per inch thickness. See data sheet below for Resistance for given thicknesses.

**Incombustible**—The mineral fibers will not burn or support combustion.

**Resistance to Vapor Transmission**—The asphalted paper resists the passage of water vapor and protects against condensation. It has a vapor permeability factor of 1.00 perm†, which is within the limits of permeability recommended by many recognized authorities for normal building occupancy.

**Uniform Effectiveness**—Manufactured to closely controlled tolerance for density and dimension, for uniform insulation.

**Stability**—Highly resilient. Resists settling. The mineral fibers are resistant to decay, corrosion, moisture and all other forms of deterioration.

**Resistant to Vermin**—The mineral fibers offer no sustenance to vermin or rodent life.

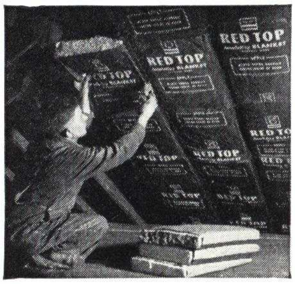
**Light Weight**—see table below.

## LIMITATIONS OF USE

**1. Masonry Walls**—It is strongly recommended that at least a 1" air space be provided between insulation and exterior masonry. Suitable weep holes are recommended. If RED TOP Wool is placed in direct contact with exterior masonry walls, the masonry **must be watertight** to prevent the insulation from becoming wet. The insulation is less effective and may transmit moisture to interior finishes if it becomes wet by direct contact with leaking exterior masonry.

**96" length reduces cutting, speeds sidewall application, assures continuous floor to ceiling vapor barrier.**

**Ceiling Application**



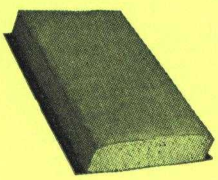
**Roof Application**

**2. Metal Lath and Channel Ceilings**—Suspended ceilings may be insulated with blankets installed with the vapor barrier down and all joints butted tightly together.

If preferred, granulated wool may be used for suspended ceilings and installed by a wool blowing machine. Many other types of otherwise inaccessible installations may be best served with granulated wool blown in place using blowing machine. However, a suitable vapor barrier should be provided, equal in effectiveness to the one provided with RED TOP Blankets. Many standard asphalt coated and impregnated papers, aluminum foil, good oil paints and varnishes will meet this requirement. Roofing felt is not recommended.

**3. Floors over Unexcavated Areas**—Insulating batts used between floor joists over unexcavated areas should be provided with additional support to insure a permanently effective installation. In all cases, the unexcavated area should be ventilated. (See page 4.)

## PRODUCT DATA

| | Type | Approx. Thickness | Framing Spacing | Length | Approx. Weight Sq. Ft. | Conductance (1) | | Resistance | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | (k) | (C) | 1/k | 1/C |
|  **Enclosed Blanket** | BLANKETS | Medium 2" | 16", 20" or 24" O.C. | 24", 48", 96" | 0.58 Lbs. | 0.27 | 0.135 | 3.70 | 7.40 |
| | | Thick 3" | | 24", 48", 96" | 0.87 Lbs. | 0.27 | 0.090 | 3.70 | 11.10 |
| | | Economy 1½" | | 96" | 0.48 Lbs. | 0.27 | 0.180 | 3.70 | 5.55 |
| | NODULATED | 2" | Supplied in Nodulated Form (Non-Preformed Dimension) | | 1.00 Lbs. | 0.27 | 0.135 | 3.70 | 7.40 |
| | | 4" | | | 2.00 Lbs. | 0.27 | 0.067 | 3.70 | 14.80 |
| | | 6" | | | 3.00 Lbs. | 0.27 | 0.045 | 3.70 | 22.20 |

(1) Expressed in Btu per sq. ft. per hour per degree F. temperature difference. (k) is per inch thickness, (C) is for thickness stated.

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*Trademark Reg. U. S. Pat. Off.

†Grains per square foot per hour per inch of mercury vapor pressure difference.

# RED TOP INSULATING WOOL

## COEFFICIENTS FOR USE IN CALCULATING HEAT TRANSMISSION

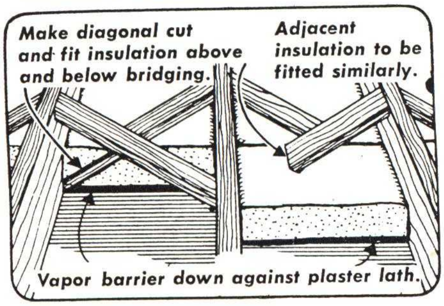
| MATERIAL | DESCRIPTION | Conductivity† or Conductance |  | Resistance |  |
|---|---|---|---|---|---|
|  |  |  |  | Per Inch Thickness | For Thickness Listed |
|  |  | (k) | (C) | 1/k | 1/C |
| **AIR SPACES** | Vertical ¾" or more in width |  |  |  |  |
| (Bounded by ordinary materials) |  |  | 1.10 |  | 0.91 |
| (With aluminum foil one side) |  |  | 0.46 |  | 2.17 |
| **EXTERIOR FINISHES** |  |  |  |  |  |
| (Frame Walls) |  |  |  |  |  |
| Brick Veneer | 4" thick (nominal) |  | 2.27 |  | 0.44 |
| Wood Shingles |  |  | 1.28 |  | 0.78 |
| Yellow Pine Lap Siding |  |  | 1.28 |  | 0.78 |
| **INTERIOR FINISHES** |  |  |  |  |  |
| Gypsum Plaster |  | 3.30 |  | 0.30 |  |
| Gypsum Board—½" | Plain or Decorated |  | 2.82 |  | 0.35 |
| Gypsum Lath & Plaster | Plaster Thickness ½" |  | 2.40 |  | 0.42 |
| Insulating Board |  | 0.33 |  | 3.03 |  |
| Plaster Base, ½" Thick | Plaster Thickness—½" |  | 0.60 |  | 1.67 |
| Metal Lath and Plaster | Plaster Thickness—¾" |  | 4.40 |  | 0.23 |
| Wood Lath and Plaster |  |  | 2.50 |  | 0.40 |
| **MASONRY MATERIALS** |  |  |  |  |  |
| Brick | Common |  | 1.25 |  | 0.80 |
| Brick | Face |  | 2.30 |  | 0.43 |
| 3" Clay Tile (Hollow) | 1 Air Cell Direction Heat Flow |  | 1.28 |  | 0.78 |
| 4" Clay Tile (Hollow) | 1 Air Cell Direction Heat Flow |  | 1.00 |  | 1.00 |
| 6" Clay Tile (Hollow) | 2 Air Cell Direction Heat Flow |  | 0.64 |  | 1.57 |
| 8" Clay Tile (Hollow) | 2 Air Cell Direction Heat Flow |  | 0.60 |  | 1.67 |
| 10" Clay Tile (Hollow) | 2 Air Cell Direction Heat Flow |  | 0.58 |  | 1.72 |
| 12" Clay Tile (Hollow) | 3 Air Cell Direction Heat Flow |  | 0.40 |  | 2.50 |
| Concrete | Light Weight Aggregate | 2.50 |  | 0.40 |  |
| Concrete | Sand and Gravel Aggregate | 12.00 |  | 0.08 |  |
| 3" Concrete Blocks | Hollow—Cinder Aggregate |  | 1.28 |  | 0.78 |
| 4" Concrete Blocks | Hollow—Cinder Aggregate |  | 1.00 |  | 1.00 |
| 8" Concrete Blocks | Hollow—Gravel Aggregate |  | 1.00 |  | 1.00 |
| 12" Concrete Blocks | Hollow—Gravel Aggregate |  | 0.80 |  | 1.25 |
| 8" Concrete Blocks | Hollow—Cinder Aggregate |  | 0.60 |  | 1.66 |
| 12" Concrete Blocks | Hollow—Cinder Aggregate |  | 0.53 |  | 1.88 |
| 3" Gypsum Tile | Hollow |  | 0.61 |  | 1.64 |
| 4" Gypsum Tile | Hollow |  | 0.46 |  | 2.18 |
| **ROOFING MATERIALS** |  |  |  |  |  |
| Asphalt Shingles |  |  | 6.50 |  | 0.15 |
| Built-up Roofing | Assumed Thickness—⅜" |  | 3.53 |  | 0.28 |
| Heavy Roll Roofing |  |  | 6.50 |  | 0.15 |
| Wood Shingles |  |  | 1.28 |  | 0.78 |
| **SHEATHING** |  |  |  |  |  |
| Gypsum—½" |  |  | 2.82 |  | 0.35 |
| Insulating Board—25/32" |  |  | 0.42 |  | 2.37 |
| Fir & Yellow Pine (1") | Actual Thickness—25/32" |  | 1.02 |  | 0.98 |
| **SURFACES** |  |  |  |  |  |
| Still Air | Ordinary Non-Reflective Materials |  | 1.65 |  | 0.61 |
| 15 MPH Wind Velocity | Ordinary Non-Reflective (Vertical) Mat'ls. |  | 6.00 |  | 0.17 |
| **WOODS** |  |  |  |  |  |
| Maple or Oak |  | 1.15 |  | 0.87 |  |
| Yellow Pine or Fir |  | 0.80 |  | 1.25 |  |
| Fir Sheathing—Building Paper and Yellow Pine Lap Siding |  |  | 0.50 |  | 2.00 |

†Expressed in Btu per sq. ft. per hr. per deg. F. temperature difference. Conductivities (k) are per inch thickness and conductances (C) are for thickness of construction stated, not per inch of thickness.

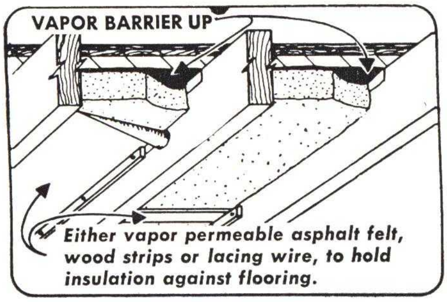
# RED TOP INSULATING WOOL

## HOW TO APPLY RED TOP INSULATING WOOL

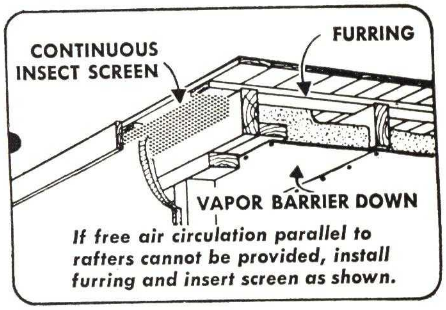
**CEILING JOISTS** (over heated areas)


Make diagonal cut and fit insulation above and below bridging.
Adjacent insulation to be fitted similarly.
Vapor barrier down against plaster lath.

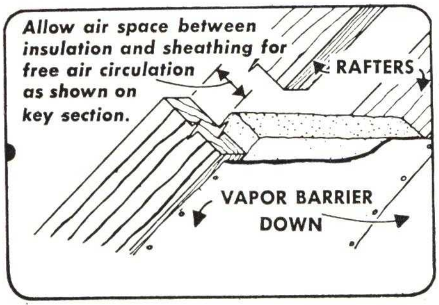
**CEILING JOISTS** (over unheated areas)


VAPOR BARRIER UP
Either vapor permeable asphalt felt, wood strips or lacing wire, to hold insulation against flooring.

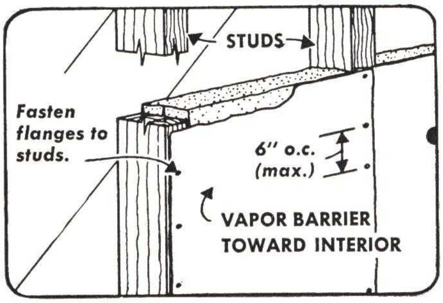
**RAFTERS** (flat roof or ceiling)


CONTINUOUS INSECT SCREEN
FURRING
VAPOR BARRIER DOWN
If free air circulation parallel to rafters cannot be provided, install furring and insert screen as shown.

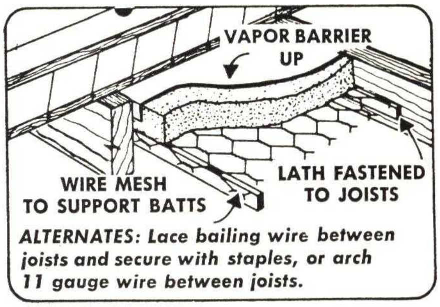
**RAFTERS** (pitched roof)


Allow air space between insulation and sheathing for free air circulation as shown on key section.
RAFTERS
VAPOR BARRIER DOWN

**SIDEWALLS**



**FLOOR JOISTS** (over unexcavated areas)


VAPOR BARRIER UP
WIRE MESH TO SUPPORT BATTS
LATH FASTENED TO JOISTS
ALTERNATES: Lace bailing wire between joists and secure with staples, or arch 11 gauge wire between joists.

## VENTILATION

**Attics,** natural ventilation through at least two fixed vents or louvers should be provided in unfinished attics or closed-off spaces between the insulation and roof, both to reduce moisture in those spaces during winter, and to vent heated air in summer. In every installation, vents should be located to insure complete ventilation of the space under consideration.

Tests at the University of Minnesota Experiment Station have established the following minimum ventilation areas:

**For gable or hip roofs,** there should be at least two vents, jointly providing not less than 1 square foot of free inlet and 1 square foot of free outlet area for every 300 square feet of attic floor area.

**Under flat roofs,** the inlet and outlet vents should each be not less than 1 square foot of free air area for every 150 square feet of roof area. If the space has small vertical clearance and large horizontal area, mechanical ventilation may be necessary. This should not be less than 6 cubic feet per hour, per square foot of horizontal area under the roof.

**Basements and crawl spaces,** under buildings, the minimum vent areas should total 2 square feet per 100 lineal feet of building perimeter, plus ⅓ of 1 per cent of the ground area covered. Good practice also includes:

1. At least 4 vent openings, one near each corner of the building.
2. These openings should be placed as high as possible from the ground, close to the bottom of the floor joists.
3. Vents should remain open all year round. This is important.
4. In very cold climates, insulation should be installed under the floor and around exposed pipes and duct work.

Special treatment should be given ground areas under buildings located over damp or wet earth. This istrue whether there is a basement or not. Concrete basements should be waterproofed. Exposed earth should be covered with 55 pound asphalt-coated roll roofing, with all joints well lapped and ground underneath well drained. Even when the ground cover is used, at least 10% of the minimum basement and crawl-space ventilation recommended here should be used.

Where vents are protected by screens or rain louvers, whether in basement or attic, the net vent areas recommended should be maintained by increasing the size of the openings as follows:

| TYPE OF COVERING | SIZE OF OPENING |
|---|---|
| ¼″ hardware cloth | 1 times net vent area |
| 8-mesh screen | 1¼ times net vent area |
| 16-mesh screen | 2 times net vent area |
| ¼″ hardware cloth and rain louvers | 2 times net vent area |
| 8-mesh screen and rain louvers | 2¼ times net vent area |
| 16-mesh screen and rain louvers | 3 times net vent area |

## INSULATION SPECIFICATIONS

### SCOPE

Unless otherwise shown on plans, all insulation shall be furnished and installed according to these specifications.

### MATERIAL

Insulation shall be (delete those not applicable to the project)
Thick RED TOP Insulating Wool Blankets.
Medium RED TOP Insulating Wool Blankets.
RED TOP Insulating Wool Nodulated.
All as supplied by the United States Gypsum Company.

### APPLICATION

Insulating Wool Blankets shall be installed within the stud spaces of all exterior walls and between the framing members of the top floor ceiling or roof by (1) attaching the flanges of the wool blanket to the face of the framing members, (2) recess the blanket and tack the flanges to the sides of studs or joists. The asphalted vapor barrier shall face the inside of the building and the nailing flanges shall be tacked or stapled securely. Sufficient tacks or staples shall be used to avoid gaps or bulges in the vapor barrier paper. In no case, shall they exceed a spacing of 6″ on centers. Apply Insulation in all framing spaces as specified and, where necessary, the insulation and vapor barrier shall be cut to fit in a neat and workmanlike manner.

The contractor shall be responsible for breaks or tears in the vapor barrier. All such breaks or tears shall be repaired by cementing over each break, with asphalt, a piece of vapor barrier paper, cut to extend at least 6″ from the break in all directions.

*Floor Insulation*—For insulation between floor and unexcavated space, the "Application" portion of the specification shall be changed to include this work, and the following paragraph should be added:

"RED TOP Wool Blankets or Batts shall be held and supported from the underside of the floor joists by galvanized wire mesh or other moisture-resistant material.

AIA FILE NUMBER 39-B

TECHNICAL INFORMATION

# ACOUSTICAL

# PLASTERS

**UNITED STATES GYPSUM**
**The Greatest Name in Building**

GENERAL OFFICES—300 WEST ADAMS STREET, CHICAGO 6, ILLINOIS

1955

AIA FILE NUMBER 39-B

# SABINITE* ACOUSTICAL PLASTER

### Trowel or Float Finish

## DESCRIPTION

SABINITE is a highly efficient acoustical plaster, scientifically prepared to give a continuous finished surface that may be either trowelled or floated. It is manufactured in four standard colors and white and requires the addition of water only.

## FUNCTION AND UTILITY

SABINITE Acoustical Plaster is particularly effective for sound conditioning.

**Sound Absorption**—Noise reduction coefficient of .60 (see table below).

**Fire Resistance**—Basically a mineral, it is incombustible.

**Strong Bond to Gypsum Base Coat**—SABINITE has a bonding strength to the gypsum base coat in excess of 500 pounds per square foot.

**Beauty**—Its fine texture trowelled surface or its slightly coarser float finish surface offers a choice of two beautiful monolithic finishes.

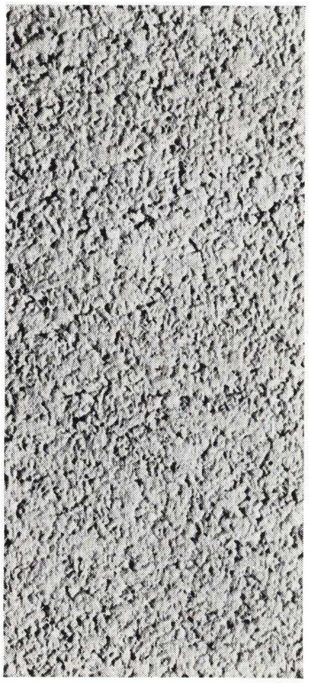
**Adaptability**—Conforms to any architectural design. Generally applied over new plastered surfaces, but may be applied over most existing surfaces or smooth monolithic concrete through use of a special asphalt emulsion bonding coat. (See application directions.)

**Colors**—Available in Oyster White, Antique Ivory, Spanish Buff, Caenstone and Colonial Cream.

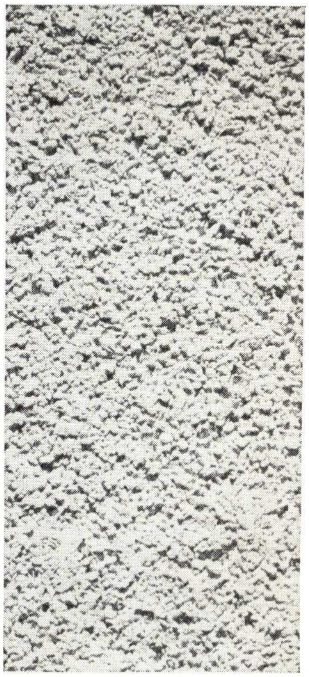
**Light Reflection**—Laboratory tests of Oyster White indicate light reflection of (.53) for Trowel Finish and (.51) for Float Finish.

**Heat Insulation**—SABINITE has a "k" value of .59.

**Maintenance**—SABINITE (trowel finish) may be cleaned using a putty type wall paper cleaner or with a vacuum cleaner using hose and brush attachment. SABINITE (float finish) may be cleaned with a vacuum cleaner using hose and brush attachment.



Trowel Finish



Float Finish

**Painting**—SABINITE may be redecorated with TEXOLITE* paint (Standard or Imperial). Apply according to U.S.G. specification for painting SABINITE. Tests show no loss in sound absorption after two spray coats.

**Easily Applied**—Any good plaster craftsman can apply SABINITE.

**Economical**—Gives more sound absorption per dollar invested than most other commonly used acoustical materials. Low in initial cost.

## LIMITATIONS

1. Designed for use on ceilings and areas not exposed to rough usage.
2. Should not be used where exposed to excessive moisture, and should not be used on the exterior where exposed to the elements.
3. To insure best results, SABINITE must be applied in strict accordance with manufacturer's directions.
4. Not recommended over radiant panel heating areas.

**"SABINITE", "TEXOLITE", "ROCKLATH", RED TOP", are registered trademarks; owned by the United States Gypsum and used by it to distinguish its products. "SABINITE" identifies the particular acoustical plaster; "TEXOLITE" identifies the particular interior paint; "ROCKLATH" identifies the particular plaster base; "RED TOP" identifies the particular plaster; all manufactured by United States Gypsum.**

***Trademarks Reg. U.S. Pat. Off.**

# SABINITE ACOUSTICAL PLASTER

## SOUND ABSORPTION DATA

| SABINITE ACOUSTICAL PLASTER | Thickness | 128 | 256 | 512 | 1024 | 2048 | 4096 | NRC | Authority |
|---|---|---|---|---|---|---|---|---|---|
| Trowel Finish | ½ Inch | .54 | .27 | .47 | .76 | .99 | .88 | .60 | Riverbank Lab. |
| Float Finish | ½ Inch | .49 | .22 | .42 | .66 | .83 | .81 | .55 | Riverbank Lab. |

## MIXING AND APPLICATION DIRECTIONS

### SABINITE ACOUSTICAL PLASTER TROWEL OR FLOAT FINISH

#### Mixing

**Machine mixing recommended.** Put 22 quarts clean water in mixer for each bag of Sabinite. Add Sabinite to water and mix until mortar weighs 15 to 18 lbs. net per 12-qt. pail (usually 3 to 5 minutes, depending on speed of mixer). For hand mixing, place Sabinite in one end of mixing box. For each bag of Sabinite add 23 qts. of clean water in other end. Hoe Sabinite into water. The mix will appear dry, but do not add more water. Mix until mortar weighs 15 to 18 lbs. net per 12-qt. pail (approximately 8-10 minutes per 2-bag batch).

#### Application

Sabinite shall be applied in 2 coats to a uniform total thickness of ½″ over a basecoat of Red Top* gypsum plaster. A full scratch and brown coat are required over metal lath, Rocklath* plaster base, and masonry bases (excluding monolithic concrete) to provide proper rigidity, strength, and a solid base for the acoustical plaster.

Apply the first coat of Sabinite ¼″ thick by scratching in and doubling back over a set semi-green gypsum plaster basecoat that is level and cross raked. If basecoat is dry, spray lightly to reduce suction. Allow to set and partially dry (at least overnight) before applying finish coat.

Apply Sabinite finish coat to a thickness of ¼″ scratching in and doubling back, over a set, partially dry first coat. Bring total thickness to ½″. Leave surface uniformly level and free of trowel marks, working from wet edge. Finish areas in one operation to avoid joinings. Trowel Finish—after gloss leaves surface and surface is firm, trowel lightly to a uniform texture. **Do not use water during troweling.** Float Finish—float second coat 5 to 10 minutes after gloss has left surface and surface is firm. Use a shingle, cork, or carpet float. **Do not use water in floating.**

#### Direct Application of Sabinite Acoustical Plaster to Existing Ceilings or Concrete:

Sabinite may be applied over existing plaster and over new or existing smooth concrete ceilings, with the use of asphalt emulsion (Type N-13 HPC or C-13 HPC) as a bonding agent.

On existing painted plaster or concrete ceilings, the surface must be dry, clean and **sound.** Calcimine or similar powder paints must be washed off and wax, grease or oil removed. Loose or improperly bonded plaster or paint must be removed and such areas repaired with wood fiber or patching plaster. Allow patches to dry 2 or 3 days. On new concrete ceilings which are smooth, level, and dense, surface must be dry, free of dust, oil, grease or efflorescence.

Size any porous concrete or porous or unpainted plaster surface with cut-back asphalt, shellac or varnish to reduce suction before asphalt emulsion is applied.

Trowel on asphalt emulsion in thin coat not to exceed 1⁄16″ thick. Cover entire ceiling area. The first ¼″ coat of Sabinite should follow application of the emulsion as closely as possible and while the emulsion is still soft and plastic. Apply Sabinite finish coat as specified previously.

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*Trademark Reg. U. S. Pat. Off.

## MIXING AND APPLICATION DIRECTIONS—Cont.

**Application of SABINITE Acoustical Plaster over Monolithic Concrete Surfaces:**

Over properly prepared rough monolithic concrete surfaces apply BONDCRETE* plaster according to directions not to exceed 1/4″ thickness on ceilings and 3/8″ on side walls. Apply the SABINITE over unset or set, green BONDCRETE basecoat, as specified above.

**Directions for Painting SABINITE Acoustical Plaster:**

**Surface Preparation:**

Remove all loose dirt or dust from SABINITE by use of a vacuum cleaner with hose and brush attachment. Putty type cleaner may be used to clean SABINITE Trowel Finish.

**Paint:** Should be water-thinned. TEXOLITE* Imperial is recommended. First coat—mix one part TEXOLITE paste to one part water by volume. Second coat if required—mix one part TEXOLITE paste to two parts water by volume.

Spray on with any gun with a medium fine spray. DeVilbiss spray gun, type MBD, with a No. 30 nozzle or equivalent is recommended. Use 30 to 40 lbs. pressure in the gun and 20 to 30 lbs. on the paint.

Hold nozzle 14 to 18 in. away from work. Use a slow, uniform motion. Cover surface in one pass. Do not pass over same area several times as this builds up paint unnecessarily.

Allow at least overnight drying between coats. If weather is extremely humid, allow additional drying as necessary.

**NOTE:** Brush painting is not recommended.

## PLASTERING SPECIFICATIONS

The following short form specification may be used in your plastering specifications.

### GENERAL PROVISIONS

General provisions for plastering apply to Acoustical Plaster application.

### SCOPE

As indicated on drawings, all walls and ceilings shall be finished as herein described.

### MATERIALS

Finish Coat—Acoustical plaster shall be [SABINITE Acoustical Plaster (Trowel Finish) (Float Finish)] (Select type) manufactured by United States Gypsum Company.

Color shall be a standard color as selected by the architect.

### MIXING AND APPLICATION

Mixing and application of Acoustical Plaster and the basecoat plaster shall be in strict accordance with the manufacturer's printed directions which are hereby made a part of this specification.

*Trademark Reg. U. S. Pat. Off.

# TEXOLITE PAINT PRODUCTS

## GENERAL SPECIFICATIONS

### GENERAL CONDITIONS

The painting contractor shall read and be governed by the general conditions at the head of the complete specifications for this project.

### MATERIALS

1. Deliver in original containers.
2. Store in protected place--to protect from damage by elements and tampering.
3. Use all materials in strict accordance with manufacturer's directions.

### SURFACE PREPARATION

#### Interior Surfaces

1. All surfaces must be dry, sound, firm, clean, and free of dust, dirt, grease or oil.
2. Fill all nicks, gouges, cracks and other surface imperfections with TEXOLITE Spackling Putty. Use RED TOP Patching Plaster to repair large holes and cracks in plaster. Repaired surfaces shall be sanded smooth and dust removed before decoration.
3. Wood surface--except floors. New wood (not previously painted), sanded smooth, touch up knots, sap streaks, pitch spots with shellace. Previously painted wood--apply one coat TEXOLITE Sealer.
4. Metal Surfaces--remove grease, oil and plaster spatterings Apply one coat rust inhibitive primer.
5. Plaster

   New Plaster (Including COVER COAT)
   - (a) Do not paint until dry.
   - (b) Apply one coat of TEXOLITE Primer to all new plaster surfaces. (Note to Architect: Use of TEXOLITE Primer assures that no free lime is available to saponify the oil in paint film, permits earlier painting over new plaster).
   - (c) Surfaces to be finished with TEXOLITE Semi-Gloss or TEXOLITE Stipple finish, apply one coat TEXOLITE Sealer.

   - (d) If pastel colors are to be used (ready mixed colors) apply directly to TEXOLITE Primer.
   - (e) If deep tones (custom colors) or pure accent colors are to be used, apply 2 coats of Sealer over TEXOLITE Primer.

#### Old Plaster Previously Painted.

- (a) Remove all loose or scaling paint and repair as in (2) above.
- (b) Surface to be finished with TEXOLITE Semi-Gloss, apply 2 coats Semi-Gloss.
- (c) For other finishes--ready mixed colors, 1 coat TEXOLITE Sealer. Custom Colors or Accent Colors--apply 2 coats TEXOLITE Sealer.

6. Gypsum Wallboard

   After preparing joints and nailheads in accordance with manufacturer's directions, prepare surface as for Old Plaster above.

7. Cement block or lightweight aggregate block.
   - (a) (If a smooth surface is desired)--brush on coat of TEXTONE or USG Texture Paint and strike off with trowel or broad knife before final set. When thoroughly dry apply one coat of TEXOLITE Primer (or TEXOLITE Sealer).
   - (b) (If texture of block is to be retained)--Apply one coat TEXOLITE Primer (or one coat TEXOLITE Sealer).

8. Concrete surfaces (except floors).
   - (a) Apply one coat TEXOLITE Primer (or one coat TEXOLITE Sealer).
   - (b) (If smooth surface is required on unpainted concrete)--Finish with COVER COAT and then finish as for New Plaster. (COVER COAT application to be covered under plastering specifications).

9. Floors
   - (a) Concrete--first apply one (2) coat(s) TEXOLITE Primer and allow to dry thoroughly.
   - (b) For all woodwork areas to be varnished, seal with TEXOLITE Spar Varnish--high gloss finish, thinned with 10% turpentine.

## FINISH COATS

### Interior

1. Flat Finish
   - (a) Apply one (2) coat(s) of TEXOLITE Seven Star Imperial on all surfaces except where otherwise designated.
   - (b) Apply one (2) coat(s) of TEXOLITE Imperial or Standard except where otherwise designated.
   - (c) Apply one coat TEXOLITE Stipple Finish.

2. Enamel Finish
   - (a) Apply two coats of TEXOLITE Semi-Gloss on all areas designated for enamel finish.

3. Woodwork (except floors).
   - (a) Apply one (2) coat(s) TEXOLITE Spar Varnish--High Gloss Finish.
   - (b) Apply one coat TEXOLITE Spar Varnish--High Gloss Finish followed by one coat of Satin finish.
   - (c) Apply two coats TEXOLITE Semi-Gloss.
   - (d) Apply one coat TEXOLITE Seven Star Imperial.

4. Metal Trim
   Same as for Woodwork above.

5. Floors
   - (a) Finish cement floors with two coats TEXOLITE Cement Floor Paint.
   - (b) Finish wood floors with two coats of TEXOLITE Spar Varnish--High Gloss finish.

### EXTERIOR

General. Do not apply paint when temperature of weather or surface is below 40°F. or if surface is damp. Do not paint if rain is forecast within 24 hours after application.

- (a) Porous Masonry--Apply one coat of CEMENTICO.
- (b) Porous or non-porous Masonry Surfaces-Apply one (2) coat(s) TEXOLITE Exterior.

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